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GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

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We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE *in that the size of the page has been reduced from 9 in. × 12 in. to 8½ in. × 11½ in. The type area of the page remains the same, namely, 7 in. × 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war*

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Problems of Rationing

AT the present time the Government has to face the problem of applying rationing to two of the great basic industries in the country—railways and coalmining. Hitherto its incursions into the field of rationing have met with a very large measure of success, but there can be no doubt that in the realms in which the ingenuity of the administration has been used the problems which have been incurred have been in no way commensurate with those which obtain in the fields of fuel and transport. It is because of the complexity of these problems that members of the Government have expressed their unwillingness to resort to rationing. Both the Ministry of War Transport and the Ministry of Fuel & Power have studied a number of schemes which might be applied to their respective industries, and both have rejected their application, at any rate for the time being. On the other hand, the point is fast approaching at which the disparity between supply and demand must necessitate drastic measures if the war effort of the nation is not to be adversely affected. In the case of coal, it is known that production is falling short of requirements by 250,000 tons a week, or 13,000,000 tons a year, and the Government is being driven to the application of a compulsory rationing scheme for domestic consumers. One of the great drawbacks to the establishment of a scheme of rationing, in present circumstances, is the necessity for the creation of a further addition to our already unwieldy mass of bureaucrats and, of course, there are political implications in dealing with coal, of which the Government is not unmindful. From the transport point of view, the outstanding need at the moment is to bring about some reduction in travel beyond that which can be obtained by appeals to the public for voluntary abstinence. How great is the margin of unessential travel, at the present time, cannot be estimated with accuracy, but it can hardly be held that conditions on the railways are inducive to travelling for pleasure, although no doubt there are many still who are willing to endure the discomforts entailed without justification from the national viewpoint.

A Question of Priority

The matter of priority between railways and coal must obviously rest with those who can have before them complete data on which to base their conclusions, but the two problems are to some extent interlinked. Railways cannot run unless assured of an adequate coal supply, no more than coal can be moved in the requisite quantities unless an efficient freight railway system is maintained. It was made known recently, when the Minister of War Transport announced the travel restrictions which are to be enforced during the winter, that passenger miles worked on the railways have increased during the war by more than 50 per cent., but that passenger train miles have declined by over 25 per cent. This means, of course, that the trains are now carrying on the average twice their peacetime load. The decision to curtail road services during the winter must have the effect of diverting more passenger traffic to the railways, and it is obvious that there are limits to the extent to which carrying capacity can be increased. It is probable indeed, that these limits have very nearly been reached, and that therefore any further additions can be carried only at the expense of less urgent traffic, which in existing circumstances in the main must mean passenger traffic. The problem of reducing the volume of passenger traffic is daily growing more acute and must continue to do so in view of the constant additions which are being made, in the form of service personnel from overseas, to the population of this country. In an attempt to deal with those whose journeys are not "really necessary," we have suggested a rationing system based on the use of coupons from the general ration book. It may not be practicable for reasons of manpower or similar disabilities, but at least it provides a basis for discussion, and if it must be rejected as impracticable some alternative proposal should be forthcoming before the need for action becomes so acute that resort has to be had to very drastic measures.

Bus Industry Reorganisation

The important segregation of assets between Thomas Tilling Limited and the British Electric Traction Co. Ltd. in provincial motorbus operators jointly controlled through Tilling & British Automobile Traction Limited, has now been approved at an extraordinary general meeting of the last-named company, the proceedings of which are reported at page 309. From the time the scheme was propounded its acceptance was regarded as a foregone conclusion, if only for the fact that the two parent companies at present hold in equal proportions over 94 per cent. of the total issued share capital of the T. & B.A.T. company. Despite the relative smallness of holdings in the hands of other shareholders, the two parent organisations have prepared the

segregation scheme with great care and with exceptionally high regard for the interests of the minority holders. In fact, it would appear that the only substantial criticism raised was that of a preference shareholder who felt that his new holdings would be more liable to be affected by fluctuations in profits of individual operating companies than in the past. Sir Frederick Heaton stated that, although this was a fair comment, it represented a position of academic interest only, in view of the strength of the security of the preference shareholders. The effect of the scheme, as we have previously explained, is to place one half of the T. & B.A.T. business under the direct financial control and management of the British Electric Traction Co. Ltd., and the other half under Thomas Tilling Limited. As each "parent" has independent bus interests, apart from the joint holdings, the result will be to reduce three controlling influences to two, and thus simplify management, leading, in the opinion of the directors, to greater efficiency, and facilitating co-ordination, although superficially the scheme might be held to represent a development contrary to the principles of co-ordination. Most of the underlying companies are railway-associates, but the interests and shareholdings of the railways in the operating companies are not affected in any way.

Standard Gauge from Europe to Egypt

Through railway development in the Middle East has owed much in the past to the incentive of war, and it appears that the completion of a vital link which otherwise might have remained unfinished for an indefinite period will be one of the legacies of the present war. The original trunk line of the standard-gauge railway system of Asiatic Turkey—namely the Baghdad Railway—was planned by German interests on strategic grounds, and was pushed forward energetically during the last war. Hostilities ceased before it was completed, but the through line from the Bosphorous to Syria was finished, and this, together with the standard-gauge Syrian Railways, formed the route of the famous Taurus Express. Similarly, the British Forces advancing from Egypt pushed a standard-gauge railway across the Sinai Desert which, during and immediately after the last war, was completed as far as Haifa. This left a gap between Haifa and Tripoli *via* Beirut which is now being filled, as recorded at page 306 of this issue; the section from Haifa to Beirut was opened at the beginning of September. Although for more than 20 years it has been possible to travel from Egypt to Europe by train, the link from Haifa to North Syria involved the use of the old Turkish railway through the Jordan Valley and Damascus which was (and is) of 3 ft. 5¼ in. gauge. In view of the drawbacks associated with a circuitous route and two breaks of gauge, most passengers preferred to travel between Haifa and Tripoli by car along the lovely Riviera coast road; it is along this route that the new railway is being made.

Weak Bridges

War conditions have thrust many problems of considerable complexity on to railway maintenance engineers. Among them are underline bridge problems arising out of the diversion to, or origination on, what previously were secondary routes, of traffic on a scale never previously expected, demanding the use of more powerful and heavier locomotives in addition to the weight of the traffic itself. It is difficult to find labour, and probably next to impossible to find material, for the complete replacement of many of the structures that may thus be proving inadequate to meet these changed conditions; and the bridges concerned are not confined alone to branch and secondary routes. Speed restrictions or the exclusion of locomotive classes over such routes because of one or two weak bridges may impose a costly handicap on working. In America the problem has been solved to some extent by welding additional steel on to weak members of bridges, and thus providing strength to postpone replacement indefinitely; but materials for such welding are now as difficult to obtain as those required for a new structure, and the railways are therefore thrown back on their own resources. Among these are the yards in which some railways dump their old bridges after replacement, in the expectation that suitable use may be found for the material in them other than mere scrapping. Hitherto, for reasons of corrosion, rivet-holes, and so on, little use has been made of this discarded bridge material for bridge repair; but the possibilities are worth examination. Our American contemporary, the *Railway Age*, remarks that "these old bridge yards can be made to pay dividends the size of which will depend on the ingenuity developed in using the resources they contain, and on the amount of critical materials thereby saved."

Increasing Wagon Capacity

In the drive for maximum utilisation of American wagon stock, so that it may be possible to meet the exceptional and increasing demands imposed on the railways by present conditions, many new expedients are under trial. A large American steel company, operating also various coal mines and a railway, found that its bogie coal wagons, of 50 and 70 tons capacity, could take considerably more weight of coal than was being loaded into them. It was observed that on the average the jolting caused by coupling the wagons and shunting them caused the level of the coal in the vehicles to drop by an average of 10 in. A labourer was therefore stationed with a long-handled rake in such a position that he could guide the coal, when it was being dropped at the pithead into the wagon, to the sides and ends; by more careful moving the wagons under the chutes better methods of filling were developed; and the loaders soon discovered to what extent they could leave an oversize hump of coal on the centre of the wagon, which would settle down in shunting without spillage. In this way the average contents of each wagon were increased by 6 tons, giving 92 additional wagon loads a week without increasing the number of coal wagons in use, the equivalent in capital value of 15 new wagons. Experiments were also tried in vibrating the coal cars during and after loading, in order to get rid of surplus moisture, with successful results, but unloading of the coal thus tightly packed presented certain difficulties, which could only be got over by the application of high pressure air through nozzles. Another gain will be achieved by rebuilding all the 50-ton wagons with 70-ton bodies, which their chassis can safely carry, though this will take time.

Steel Rail Problems

Some time ago an American permanent way authority warned the railways of the risk of disturbance of their relaying programmes when the bulk of their demands for rails are concentrated in the early months of the year, in preparation for spring and early summer relaying; in such conditions demands outstrip mill production, and late deliveries cannot be avoided. In Great Britain the same conditions are not unknown in peacetime, due to the reluctance of rail-users to hold rails in stock, and not only may relaying programmes and carefully-arranged possessions of track be upset in consequence, but much of the rail inspection at works has to be carried out when the days are shortest, in bad light and bad weather conditions. However, wartime rationing has inevitably resulted in a much more even spread of production than previously, and if this condition persists after the war, it will not be entirely without advantage. The same speaker tilted at the attempts made to lay rails at record speed with mechanical appliances, for the resulting tendency which he had observed in America was to sacrifice quality to quantity, especially in the line and gauge of the track. Often this hurried laying had been carried out with the intention that line and gauge should be corrected later, but by the time the correction had taken place, some of the rails had suffered damage that could not be repaired. He also referred to the problem of old rail, which although not actually in need of renewal in consequence of excessive wear, is bent in the vertical plane, battered at the ends, and perhaps burned by locomotive wheel slip and corrugated in addition. By building up worn rail-ends with weld metal, a fair percentage of sleeper renewals, a surface lift, and grinding the top surface of the rails to remove the corrugations and the burn depressions, it is possible to extend the life of a large mileage of track until complete renewal of the track is economically justifiable.

Plastic Axlebox Bearings

Although the incidence of hot boxes has been greatly diminished, and by the use of roller bearings virtually eliminated, the phenomenon is still not unknown, and it is in this direction and down the avenues of reduced weight and cost that engineers must look for improvements in the present types of railway axleboxes. In all of these connections there seems a *prima facie* view for the most serious consideration of plastic bearings. The type has already been tried for rolling stock plain bearings on the Continent, and, it is believed, with encouraging results. The material used was of laminated textile sheets impregnated with cresol resin having a resin content of 65 per cent. The greatest single factor leading to successful performance was a highly-polished surface at the beginning of the service period, and this was attained by a carefully thought out running-in period before the vehicle was sent out of the shops, and in which the outermost layer of the plastic bearings was removed and polished by running on a special mandrel having the same diameter as the journal. Before this outer layer was removed the friction was enough to make the bearing sieze at a pressure (load ÷ journal dia. × length) of 400 lb. per sq. in., but after polishing pressures of 1,000/1,200 lb. per sq. in. were carried satisfactorily at peripheral speeds up to 3¼ ft. per sec., and with a bearing temperature of 70/75° C. at that speed.

Bogeys

Long after the battle of Waterloo, parents used to threaten unruly children with a visit from Napoleon Bonaparte. It was recently our misfortune to travel from Kings Cross to Baldock in the same compartment as a child whose unruliness seemed to us to merit some equally alarming twentieth century menace, and we listened with interest to see if the harassed parents would invoke either of the Axis dictators. In fact, neither Hitler nor Mussolini was so much as mentioned, though reference was made at intervals to a certain "Uncle Fred," a far more formidable character who was represented as lurking somewhere down the corridor, and liable to appear at any moment to punish his obstreperous nephew. As the effect of this warning was extremely temporary, Uncle Fred was allowed to dematerialise, and another bogey summoned up under the title of "The Man," whose sudden advent and startling vengeance apparently outstripped anything in the repertoire of Uncle Fred. By the satisfactory effect produced we thought "The Man" must at least be "That Man Again," and so were considerably astonished to find that he was in fact none other than the travelling ticket inspector. Evidently Hitler must adopt a different uniform if he hopes to daunt the youth of Britain.

The Streamline Vogue in U.S.A.

ANY lingering doubts as to the economic value of streamlined high-speed passenger service on railways should be set at rest by the details which were given in the article in our September 11 issue and which is concluded on page 300, of streamline developments in the United States during 1941. Although it was not until 1935 that the first streamlined trains entered service in the U.S.A., by the late autumn of 1941 their number had increased to 131, and their composition to a total of over 1,000 cars, operating throughout the length and breadth of the country. A total of 36 of these trains make daily journeys over long distances at overall average speeds of 60 to 70·4 m.p.h., and exactly 100 maintain over 55 m.p.h. between terminals, in a number of instances over distances from 1,000 to more than 2,200 miles; sustained speeds of 90 to 100 m.p.h. are common even with steam. It may be argued that aerial and road competition in the United States has compelled the railways, in self-defence, to take these measures, and that the task of fitting high-speed services into their timetables has been made easier by the relative infrequency of service over many of their long-distance main lines. Such considerations alone would be insufficient to explain the great energy that has been infused into these streamline developments. It has been not merely a matter of building the stock, which has been costly enough, but several of the railways have spent millions of dollars in wholesale realignment of their tracks, to permit higher speeds with safety and comfort. New devices of all kinds have been perfected, also, to increase safety and regularity of operation, which is no small problem with, say, such trains as the Denver Zephyr and the Twin City Zephyrs of the Burlington route, the former travelling 31,110 miles monthly at an overall average of 65·4 m.p.h., and the latter 26,220 miles at the even higher average of 70·4 m.p.h.

The energy is, of course, explained by the fact that high speed pays. Not only has it paid handsomely in the United States, but there is little question that it has created traffic on a considerable scale. For example, the three competing services between Chicago and the Twin Cities of St. Paul and Minneapolis, over 400 miles away, with their five daily runs in each direction at average speeds of 65·4 to 70·4 m.p.h., have between them developed an average patronage of over 2,500 passengers daily, a total very considerably greater than the number carried previously by the sleeping car services, which took 10 hr. and more between Chicago and St. Paul as compared with the present 6-6¼ hr. Several of these flyers are now earning net revenues from $3 to $4 a mile, and when such earnings are spread over journeys running into thousands of miles, such as the City of San Francisco, with its $3.80 a mile for 2,272 miles continuously, the trains are dividend-earners of no mean order. Despite the essential economies of diesel operation, also, it may be noted that the lines which have specialised in high-speed work with steam, such as the New York Central and the Milwaukee, are by no means behind in the earnings of their streamline services; the Afternoon Hiawatha of the Milwaukee, for example, is earning $3.87 a mile, and the Mercury of the New York Central $3.68 a mile. Further, the patronage of almost all these trains, and with it the profits, is steadily on the increase, and was so even before wartime activities in the U.S.A. began to increase the density of passenger travel. It would be difficult anywhere else in the world to parallel the popularity of the streamlined Daylights of the Southern Pacific; in the first four years of their operation the Morning Daylights have carried no fewer than 1,300,000 passengers over this 470-mile route between Los Angeles and San Francisco.

Speed, of course, is not the only attraction. The railways of the United States have done their work thoroughly and well—the work of attracting the passenger, or, as the well-known American industrial designer, Mr. Raymond Loewy, put it in his recent paper to the Royal Society of Arts, "selling through design." Tradition has been abandoned in both the external appearance and interior design of the rolling stock, and these modern American trains, within the necessary limitations of space, are giving to the traveller a combination of the beauty of modern furnishings with all the amenities of club and hotel life, so making a railway journey not merely as fast a communication as practicable between any two given points, but a really pleasurable experience as well. Eminent experts in design, such as Loewy and others, have been called in to advise on both internal and external lines, and with the skilful use of brilliant colours, that can be and are maintained in perfect condition, the streamliners have been turned into a perpetual advertising medium for their owners as they flash through the countryside. As it is realised that complete streamlining of steam locomotives confers a relatively small benefit in reducing air resistance, whereas the casing in of motion tends both to increase weight unnecessarily and to add to maintenance costs, most of the streamlining has been partial only, and in its design propaganda effect has been the ruling consideration. With the streamlining of the trains there is now being associated a species of "face lifting" at terminal and other stations, and at city offices, whereby the allurement of every point at which the railway contacts the traveller is being steadily increased. Perhaps the most important outcome of all this work is, as was stressed in the paper mentioned above, the increase of railway prestige with the public so brought about; this alone must have been worth millions of dollars to the railway managements.

F. W. Webb as a Steel Pioneer

THE greatest service which F. W. Webb performed for the science of locomotive building was undoubtedly his development of the use of steel. He was by no means the first engineer, either on the L.N.W.R. or elsewhere, to employ this material; but whereas others at that time used it with great caution and frequently with small success, restricting its use to motion details and tyres, and in some cases venturing to use it for axles, Webb boldly adopted it at Crewe as the standard material for almost every purpose for which wrought iron was then being employed. Steel boilers became standard on the L.N.W.R. between 1873 and 1875, and steel frames were introduced a few years later; but even in 1890 wrought iron was by no means superseded on many of the British railways, though most engineers were by then beginning to obtain more success with the new material. The reason Webb succeeded in this respect while so many other engineers met with difficulties is not far to seek. It was not generally realised that steel required different heat-treatment, more efficient forging, and different shrinkage allowances as compared with iron, with the result that many parts failed due to their having received insufficient hammering at the wrong temperatures, or, in the case of tyres, through being shrunk on too tightly. Webb, on the other hand, having obtained previous experience of the material as manager of the Bolton Steel & Iron Company's works, was fully aware of its properties, as also was his works manager, T. W. Worsdell, afterwards Chief Mechanical Engineer of the G.E. and North Eastern Railways in succession, who had obtained his experience in the U.S.A. In consequence, these errors were not committed at Crewe.

The most widely adopted of Webb's inventions was no doubt the method of forming the firehole without a solid ring, by flanging the plates outward and riveting them together from outside—a practice now almost universal. A further improvement in boiler details was the method of mounting the injector clackboxes on the firebox backplate, where they are readily accessible in the event of a sticking valve, employing in conjunction therewith a long internal feed pipe to prevent the cool feed water coming into contact with the hot firebox. This arrangement soon superseded the clackbox mounted on the boiler barrel, which was very awkward in the event of trouble whilst running. The Webb radial axle is too well known to need any discussion; it was a simple and efficient method of providing flexibility on curves, and has been very widely adopted. A further great improvement introduced into England—though not invented—by Webb was the built-up steel crank-axle with extended webs, an arrangement applied by him to the last seven "Dreadnoughts" of 1890.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Making Up Lost Time

34, Barn Hey Crescent,
Moels, Hoylake
September 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The desirability, which in many cases may be a real necessity for trains to make up lost time is readily understandable, and the locomotive performances in this respect mentioned in your editorial are certainly noteworthy. But the additional coal consumption involved must in the aggregate surely be very considerable, and one is prompted to ask if everything reasonably possible is done to prevent loss of time in the first place.

Station working is clearly very difficult in these days of heavy traffic and wartime staffs, but even so, would it not be wise to make greater efforts to get trains away "on time"? This applies to all services including steam and electric suburban trains, which so frequently spend more time than is necessary at intermediate stations. Every second overstayed at a stop results in extra fuel consumption if that second is to be subsequently regained. In addition to emphasising the importance of this point on railway staffs, some judicious "education" of the travelling public should assist. There are probably other causes for loss of time (such as avoidable signal checks) that, in present circumstances, would repay close investigation.

You will doubtless agree that this is a matter for some concern, and in view of the present volume of late running, I venture to suggest that vigorous propaganda to *avoid* original delays on the railways should be just as important a part of the national campaign to save fuel as many other aspects now receiving so much publicity.

Yours faithfully,
R. C. SMITH

Railway Charges and Facilities

United University Club,
Pall Mall East, S.W.1
September 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—There are one or two matters in the letter of Gilbois in your September 11 issue with which perhaps I ought to deal. He says "we are not even asked to think of the joys of travelling to Tilbury instead of Blackwall and the reasons for the change." It is not a question of *change* at all. Tilbury docks have been open for a long time, and more than once in Victorian days when starting on a voyage from London I joined the ship at Tilbury; I also embarked at the Royal Albert dock; but the existence of those other facilities was no justification whatever for the closing of the line to Blackwall. This particular sentence is a good illustration of modern railway mentality; when there are alternative facilities select one of them which will give least trouble to the company, develop that and scrap the rest, and let the public do the best it can with what is left.

Gilbois is in error in thinking that American dining-car meals on the average have been more expensive than meals in British cars. More than fifty years ago, when the rate of exchange was steady at about 4·86, the price of a meal in an American car was 75 c., or in the most luxurious trains, a dollar. For that I have eaten oysters and other delicacies which would, of course, never appear on a British menu. And a little later, in 1899, after some years of travelling behind *Jeanie Deans* in the train then known as "the corridor diner" (2 p.m. from Euston), I came across a dinner on the Michigan Central which ended with finger bowls and rose-water in them! I have not been in America since the outbreak of war and do not know what present conditions may be, but up to the summer of 1938 I always found that the tea, coffee, milk, and ice-water included in the price of a dining car meal in Canada or the United States sufficed for the satisfaction of thirst, and it was quite unnecessary to order any other drinks.

As to the railway steamers, as long as the *Alma* and *Columbia* were in service I preferred the Havre route to Paris, but no one would choose that route today. Soon after the end of the last war I was at Holyhead to see the new *Anglia*; a splendid ship certainly; but Holyhead, a charming place in itself, is almost unknown to Londoners because of its wretched train service.

Of course, passenger train miles have increased in the last sixty years, but the population and the habit of travel have increased in a greater degree; and in the longest and most important of our train services, those between London and Scotland, the facilities are actually worse than they were long ago. The year 1889 saw the publication of Acworth's "Railways of England" and of Foxwell and Farrer's "Express Trains"; and anyone looking at these old books must notice the writers' pride in the superiority of British railways and their unconscious assumption that such superiority was in the nature of things and would continue for ever. The race to Edinburgh had recently attracted much attention, and, generally speaking, the British people were well pleased with their railways. Today, except in the companies' own advertisements, one never sees the railways praised; and since the motorcar has brought independence many who have a railway at their doors never travel by train at all.

I will conclude with a question. In 1877, after the building of the famous Drummond engines, trains were running on the Waverley Route in both directions between Carlisle and Edinburgh in 2 hr. 20 min. In the summer of 1939 this timing was exceeded by all regular trains. Can Gilbois tell us of any other important main line in all the world on which the best trains were slower in 1939 than they had been 62 years before?

Yours faithfully,
W. B. THOMPSON

"What Constitutes the Block Section?"

19, Lockharton Avenue,
Edinburgh
September 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was very interested in the editorial in your September 11 issue and am not surprised at discussions arising when one considers the various views which have been published from time to time. In addition to those expressed in your article, we have the B.S.I. No. 719 "Glossary of terms used in Railway Signalling" wherein definitions are given of a block section, block instrument section, and block instruments.

I think it will be agreed by most that the block instrument forms a visual reminder to both signalmen as to the state of the block telegraph section. Even under the "warning arrangements" which you quote, the lock instrument is not restored to the normal position whilst the overlap is occupied, although the bell signal "train out of section" has previously been given. The bell signal indicates that the train has passed within the protection of the home signal, thus enabling the rear signalman to offer a following train under the "warning arrangement"; but the block instrument is a visual reminder to both signalmen that the block telegraph section is still occupied. This being the case, does it not follow that it is more sound to base the definition of a section upon the actual operation of the apparatus, that is, block instrument or track circuit rather than the block regulations which all vary in some degree? Further, much confusion is caused by loosely-worded phrases. In general railway parlance, a block section is widely understood as the space between two signal boxes, thus, the introduction of an additional signal box or boxes is understood in broad railway terms to mean the introduction of an additional block section or sections.

When, however, we come to define a section in relation to the signalling of trains, I think the more correct term of "telegraph block section" or "track block section" should be used. In principle, a definition of the one is a definition of the other; but due to the incidence of a signal box in the former case, a slight modification in the wording becomes necessary. Thus, a "telegraph block section" is the length of line from the last stop signal of a signal box to the end of the overlap beyond the first stop signal at the next signal box, whereas a "track block section" is the length of line from a stop signal to the end of the overlap beyond the next stop signal. As is well known, the overlap or clearance point, applicable to a "telegraph block section" is 440 yd. in accordance with the R.C.H. Block Telegraph Regulations, but for a track block section the overlap is more scientifically calculated and varies in accordance with actual conditions.

In either method of working, facilities for following trains proceeding under a warning arrangement are provided, the only difference being that with track block working no ambiguity arises as obtains under the present telegraph block working.

Yours faithfully,
A. MOSS

POST OFFICE TRAFFIC.—As compared with a year earlier, receipts of the Post Office in the United Kingdom from postal traffic in July, 1942, showed an increase of 3·8 per cent., as against 3·6 per cent. in June and an average of about 5 per cent. in January to May. This latter percentage was higher because receipts in the early months of 1941 were affected by air raids.

The Scrap Heap

One hears from a reader that the trailer gas producer reminds him of his wife—it appears to be in tow, whilst, in reality, it is supplying the motive power.—*From "The Commercial Motor."*

* * *

Anything is Salvage

During the last twelve months, 350,000 metal bands, weighing 38 tons, have been collected from dilapidated and broken fish boxes by the L.M.S.R. staff at Fleetwood. In the same period, these enthusiastic salvage-hunters have recovered also 13 tons of old trawl netting from the sea. Among strange items salvaged for war purposes at other points on the system are horsehair, granite dust, wool pickings, abandoned boots and shoes, and 2 tons of discarded torch batteries.

* * *

An item of interest to railway officials is provided by the 150th anniversary of the Sheffield firm of John Bedford & Sons Ltd., who are contractors to many of the leading railways at home and overseas. During the whole of its history the firm has always been under the active control of successive members of the Bedford family, whose ancestors, even as far back as the year 1250, were men of considerable note and importance. This firm, established by John Bedford in the year 1792, has now expanded into a group of modern factories covering approximately 12 acres of ground, and employing more than 1,000 operatives.

* * *

Red Tape Language

"Under consideration" means :—
"Never heard of it."

"Under active consideration" means :—
"Will have a shot at finding the file."

"Has received careful consideration" means :—
"A period of inactivity covering time lag."

"Have you any remarks" means :—
"Give me some idea of what it's all about."

"That project is in the air" means :—
"Am completely ignorant of the subject."

"You will remember" means :—
"You have forgotten, or never knew, because I don't."

"Transmitted to you" means :—
"You hold the bag awhile—I'm tired of it."

"Concur generally" means :—
"Haven't read the document and don't want to be bound by anything I say."

"In conference," means :—
"Gone out, don't know where he is."

"Kindly expedite reply" means :—
"For God's sake try and find the papers."

"Passed to higher authority" means :—
"Pigeon-holed in more sumptuous office."

"In abeyance" means :—
"A state of grace for a disgraceful state."

"Appropriate action" means :—
"Do you know what to do with it? We don't."

"Giving him the picture" means :—
"Long, confusing, and inaccurate statement to a newcomer."

"Concession" means :—
"It's their's and we can't withhold it any longer. But the mere word shows we're boss."—*From "600," the magazine of George Cohen Sons & Co. Ltd.*

End of a Veteran Locomotive

In the 1860's as one of Britain's fastest passenger engines, 75-year-old L.M.S.R. locomotive No. 20008 has made her last journey—to the works for breaking up. She had a busy life. Until quite recently she continued to operate in fast passenger service as pilot engine. Later she worked the engineer's inspection saloon in the Crewe district and finally ended her career by busying herself with shunting operations at Watford. Her total mileage reached the high figure of 1,613,019.

* * *

Grass on L.M.S.R. embankments is offered free to farmers and adjoining owners who take it at their own cost. Over a thousand people have availed themselves of the facility in the last year.

* * *

Happy Days!

Below we publish a reproduction of a Programme of an excursion by "The Railway Ramblers," printed in 1884, which was recently discovered by Mr. Evan Evans, Operating Manager (Railways), London Passenger Transport Board, in turning out some old papers. Mr. Evans informs us that he does not know who "The Railway Ramblers" were, but it would appear that it was some railway society connected with the former Glasgow & South Western Railway.

A Pleasant Survival

It is pleasant to note that the crest of the Great Northern Railway, which is carried traditionally by "C 1" Atlantic No. 4442, has been retained by this locomotive despite its appearance in the black wartime livery of the L.N.E.R.

* * *

Sharp Rivalry

The Southern Railway's scheme for the salvage of old razor blades has been very successful and keen competition between stations has ensued. London Bridge, which is collecting about 13,000 blades a fortnight and has reached a total of 66,000, is followed closely by Charing Cross with 65,000 and Holborn Viaduct with 50,000. Proceeds from the sale of the steel go to the R.A.F. Benevolent Fund, which so far has acknowledged receipt of £106 from 8 cwt. of blades.

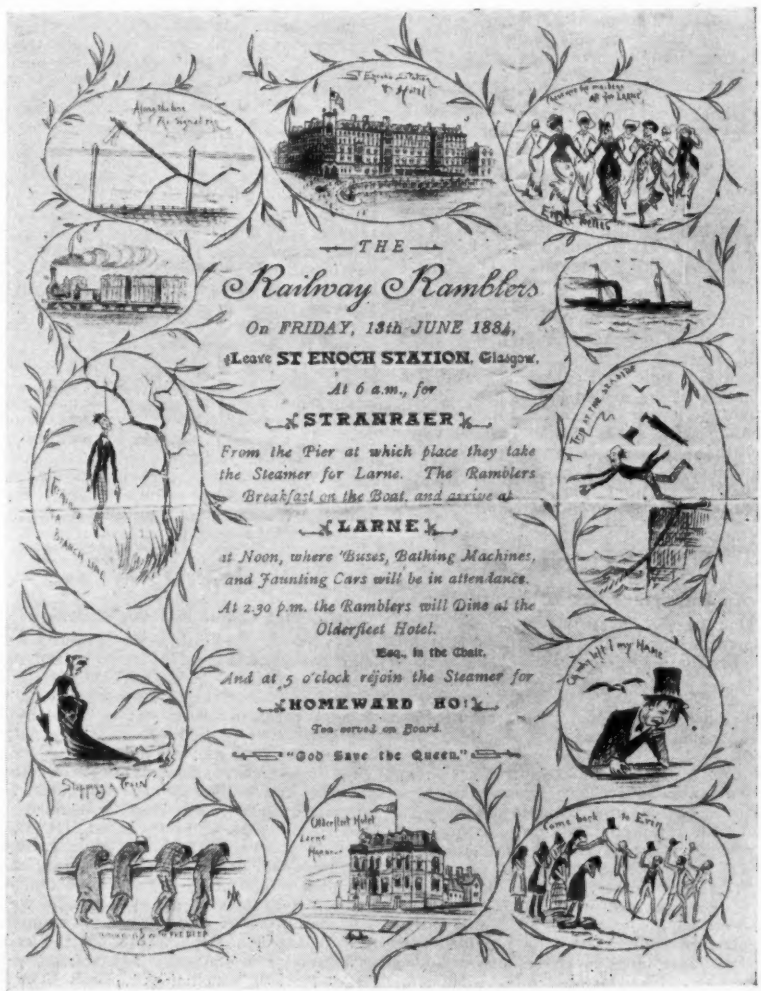
* * *

Tailpiece

When recently a man was fined a pound for smoking in a non-smoking Underground coach, a protesting fellow-passenger who had knocked the lighted cigarette out of defendant's mouth was complimented by the magistrate.

He lit it, puffed it, knowing what he did.
It cost (plus costs) a gasper and a quid.
And now one hopes he has the lesson pat,
"*Défense de fumer* means precisely that."

E. C.



OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

CANADA

C.N.R. Capital Expenditure

An Act was passed recently providing $22,360,000 for capital expenditure by the Canadian National Railways. Of the amount specified, $16,210,000 was for general additions and improvements. On the second reading in the Senate, it was urged that capital expenditure by the C.N.R. should be kept to a minimum so as to reduce the burden of debt. Another speaker said that, although he did not oppose the bill, he thought that it should be recognised that business could not be expected to continue at its present level, and that heavy capital expenditure would result in extensive obligations for the payment of interest. A third senator, however, pointed out that the Canadian Pacific Railway was making larger appropriations for extension and improvement than the Canadian National Railways, and said it was important that a high standard should be maintained. Completion of the new Montreal terminal was an immediate need, and heavy expenditure was being incurred also in providing facilities for war industries. An appeal was made for improved station accommodation at Windsor, Ontario, which was inadequately provided in this respect, although it had become one of the most important terminal points in Canada.

Peak Traffic

Colonel J. A. Cross, Chief Commissioner, Board of Transportation Commissioners, said recently that 60,000,000 passengers would have been carried by Canadian railways by the end of 1942, which would represent the highest figure ever attained in the Dominion. The peak year so far had been 1921, during which 51,000,000 passengers were conveyed. The lowest figure was that of 19,000,000 in 1933. He went on to say that passengers were benefitting now by very low fares; they were paying on the average 1·8 cents a mile, whereas the normal coach fare was 3 cents a mile. Reductions granted to members of the Armed Forces had brought about the lowest fares in Canadian history. Dealing with goods traffic, Colonel Cross said that the peak figure of 50,000,000,000 ton-miles was handled by Canadian railways in 1941, compared with the lowest figure of 21,000,000,000 ton-miles during 1933.

UNITED STATES

An Important C.T.C. Installation

One of the most important signalling contracts placed for some time is that for the installation of centralised traffic control over 175 miles of single track between Las Vegas, Nevada, and Daggett, California—the principal main line of the Union Pacific RR. from Omaha to Los Angeles; the contract has been secured by the Union Switch & Signal Company. The entire route will be controlled from one end, by a single C.T.C. machine located at Las Vegas and with automatic train-graph equipment to register train movements throughout the whole territory. Signals will be of the "H 2" searchlight type, and switches will be power-operated with style "M-22-B" low-voltage d.c. switch-and-lock machines; electric switch-locks will be provided also for all manually-operated switches along the route. Control, indication, and communication over the entire 175 miles will be maintained over one pair of wires; the stretch of line concerned will be divided into three sections of approximately equal length, two of which will be controlled and indicated by Union, coded and transmitted over the same pair of line wires which transmits the d.c. code control to the first section, that nearest to the control machine at Las Vegas.

Toledo, Peoria & Western Wages

Standard wages and working conditions for engine- and train-service employees have been laid down by the Director of the Office of Defense Transportation for the Toledo, Peoria & Western RR.; it will be remembered that, as the result of a strike in the early part of the year, the Federal Government assumed control and took over its operation. The wages and conditions are on the same basis as those generally in force on United States railways, although certain modifications have been made to meet operating conditions peculiar to the T.P. & W., which acts as a "bridge" route by-passing Chicago and connecting a number of important main lines. The average net monthly increase in the payroll of the railway is estimated at $3,200, but the effect of the new rules probably will be to eliminate a considerable amount of money which has been paid hitherto in overtime, as a result of the revision of train schedules. The wage increases are made retrospective to March 25 last, the date at which the Government took over.

Pennsylvania Horse-Power

For American railways to revert to the use of the horse to meet operating needs is a revolution indeed, but the first steps in this direction, compelled by the effect of rubber and petrol shortage, are already being taken. The Pennsylvania Railroad has begun to use horse-drawn vehicles for local cartage service in Philadelphia, and, as more horses become available, the use of these vehicles will be increased. The matter is being made the subject of serious study, in order to determine what adjustments and changes will be necessary to adapt pick-up and delivery service generally to horse-drawn transport; a survey is being made also to ascertain the availability of horses, mules, harness, and horse-drawn vans. Enquiry also is being made as to the possibility of importing draught horses from Canada and Mexico in the event of the United States supply proving insufficient.

SPAIN

Imperial Canal relieves Railway

To relieve the railway between Gallur and Zaragoza the traffic on the Imperial Canal has been organised with considerable success. A number of 70-ton barges and 4 diesel tugs are now in service; usually a tug takes two barges and an average daily tonnage of 80 tons was moved for several months. Wheat from the Cinco Villas district and building materials are the principal loads. All wheat consumed in Zaragoza now passes by the canal. It takes 6 hr. to make the trip from Gallur, so that two trips can be made daily in spring and summer. The costs are low and the intention is to develop the canal traffic very considerably. A grant has been made to the Waterways Department for the construction of more heavy lighters, as well as quays and warehouses at Casa Blanca, Grisén, and Gallur, and the capacity of the service will shortly be greatly increased. The Gallur-Zaragoza railway was formerly much congested and the situation has been noticeably improved by the canal developments.

State Railway Organisation

When the Government took over the broad-gauge railways in February, 1941, working was continued, as a temporary measure, on a divisional basis; the territory was divided in three "zones" corresponding to the systems of the three principal companies, Northern, M.Z.A., and Western-Andaluces. A series of circulars dated May 1, 1942, now lays down the lines of the permanent organisation of the national system. This is on departmental lines, divided between six "servicios," or departments, to be known as Traction & Rolling Stock, Way & Works, Commercial Service, Operating, Stores, and Fuel. The acquisition, storage, and delivery of fuel, previously a function of the general Stores Department, is now given to a separate division, but the Way & Works Department is to continue to hold its own stocks of material. Each department is divided technically into sections, each with its responsible head, and geographically into districts, according to density of traffic and extent of existing installations. Most of the running sheds and repair shops, and the stores depots taken over from the companies, will continue in use, at least until the locomotive and rolling stock position has been restored to normal.

Debenture-holders' Plight

At the Northern Railway of Spain Company's annual meeting on May 19, reference was made to the difficult position of the railway debenture holder. No interest has been paid on the Northern or M.Z.A. debentures since 1936, and now there is the unexpected delay in fixing the amount of the annuity which the companies are to receive by way of compensation for the taking over of their lines. In many cases the debentures are held by small investors, and their plight is serious. The Chairman of the Northern Railway said he had hopes of an early settlement by the Government.

CEYLON

Opposition to Road-Transport Plan

There has been much opposition to Mr. S. W. Nelson's plan for reorganising the passenger road-transport industry of Ceylon, to explain which personally to the bus owners he has attended a number of meetings in various parts of the island. (Details of this scheme were given in our September 18 issue.) Many bus owners have agreed to form limited liability companies, but critics maintain that these companies will not benefit small owners, although Mr. Nelson's plan has as one of its main objects the safeguarding of their interests. A large number of the latter own and drive one bus each, and it is suggested that no advantage would accrue to them, apart from the fact that hardship might be caused on account of their existing contracts and other obligations. It is feared also that unemployment might be caused, but Mr. Nelson has pointed out in this connection that in Malaya, where the conditions were very similar, and where the bus owners were formed into companies, the total number employed as drivers and conductors increased from 3,700 to 4,450. He points out also that, in present circumstances, when an owner-driver's bus wears out he may be forced to go out of business, but under the company scheme his position would be secured.

Rationalisation of Road Transport in South Africa

A discussion of some aspects of the problem by Mr. G. W. Reid A.M.Inst.T., Acting Manager, Road Motor Services, South African Railways & Harbours Administration*

ALL elements in transport are part of one system and its ramifications and complexities present such serious obstacles in the practical application of any general scheme of rationalisation that there is, in consequence, no alternative but to sectionise the problem as far as possible and endeavour to define principles which will permit of individual interests being co-ordinated for the benefit of the country as a whole. At the outset it would be as well to be clear on what we mean by the term rationalisation. In the economic sense, it is a balancing of production against consumption, or, more briefly, the cutting out of waste. Co-ordination and control are, therefore, implicit in the rationalisation of industry, including transport.

Expansion of industry during the past ten or fifteen years has been very marked in South Africa and road transport has advanced in sympathy with this expansion beyond all expectations. When we consider the remarkable increase in the number of vehicles imported in recent years, and there are approximately 330,000 private motorcars and 56,000 motor lorries in the Union to-day, apart from Government-owned vehicles, which are not registered under Provincial licences, it would surely be no exaggeration to describe this as the Golden Age of transport. Now we are faced with the necessity for stringent economy in the use of vital commodities and although some vehicles already have been immobilised, it is certain that much more of the transport still operating for business or pleasure purposes will have to be put off the roads before long.

The war has come very much nearer to South Africa and whatever feelings of complacency we may have cherished in the past, they have been rather rudely shattered by recent events. With Japan's entry into the war, essential supplies from the East Indies, including about 86 per cent. of the world's supply of rubber, have been cut off. The seriousness of this position will be apparent to all.

Reactions to Transport Curtailments

Press comment indicates that considerable public interest has been aroused in the subject of transport; not so much on account of its intrinsic merits and value to the community, but rather as a result of enforced economies in the use of privately owned motorcars, and in the case of those who patronise public vehicles, the inconvenience and difficulty of finding even standing room during peak periods when buses are filled to capacity. These are, of course, the immediate effects of the curtailment of transport facilities and we have not yet become fully accustomed to them, but whatever the eventual psychological reactions towards transport may be, the restrictive measures rendered necessary under wartime conditions will certainly bring home to everyone the basic fact that transportation is an essential factor in modern life, and that no business or industry can survive without it. The burdens which the transport industry will have to bear during the trying times, which undoubtedly lie ahead, will tax its resources to the utmost, but they will also bring opportunities for serving the public and assist in creating that valuable commodity in business covered by the word "goodwill."

Groups of Transport

Let us for a moment consider, in broad outline, the various interests and the basic structure of transport in South Africa on which the economic life of the community is completely dependent. These may be divided into groups as follows:—

First group.—State-owned transport of which the railways and road-motor services catering for the conveyance of passengers, mails, and freight, and cartage services for the collection and delivery of goods in towns, form the main revenue-earning group. No comment on transport in South Africa would be complete without reference to the largest transport undertaking in the country, namely, the South African Railways. A network of railways is provided serving all parts of the Union and the mandated territory of South West Africa. The whole system represents approximately 14,000 route miles.

An advantage of the highest economic importance is the abundance of coal in South Africa which provides the fuel for steam engines hauling trains and for generating the power for electric traction. With the existing shortage of supplies of rubber and petrol and the long distances involved in the haulage of traffic, it would be impossible to carry on transport essential to the war effort and the life of the community without the railways.

Another important phase of the railways organisation is the road motor services, which have developed very rapidly in recent years and no less than 17,500 route miles are operated. They are so located that they function as feeders to the main railway system. The quantity of traffic conveyed (passengers and freight) is considerable and a few operating statistics are quoted below which will give some idea of what the road motor services mean to South Africa:—

Total vehicle miles operated a year ...	13½ million
Total number of passengers conveyed a year	9 million
Goods traffic a year	1¼ million tons
Cream traffic a year	2 million gal.
Number of large heavy-type vehicles in service	700
Number of heavy type trailers in service	400

A third feature is the cartage services which are established in all the important centres throughout the Union. At some towns and harbours departmentally-operated cartage services are in operation. The majority of towns are, however, served by cartage contractors to the railways administration. These cartage services, as a whole, fulfil an important function in the transport of goods traffic. In addition to the services mentioned, large fleets of non-revenue earning vehicles belonging to the State are operated for official purposes, including statutory services.

Second group.—Provincial and municipal transport comprising road construction plant, vehicles used for cartage of stores, and so forth, and utility vehicles on health services and the like. This considerable plant is, of course, distinct from the passenger carrying transport operated by most of the large municipalities on a revenue earning basis.

Third group.—Privately-owned transport included in the category of common carriers and consisting of lorries, buses, and taxis for the conveyance of goods and/or passengers for reward.

Fourth group.—Privately-owned transport including merchants' delivery vans, farmers' lorries, and a very large number of motorcars used for business or pleasure purposes.

Interdependence of Groups

At the outset it must be recognised that although all these groups are separate in character and are operated under widely-varying conditions, they react on each other in many ways. It is therefore, impracticable to isolate and apply restrictive measures to any particular group without causing repercussions in other directions. For instance, the immediate withdrawal of a large number of private cars from the roads would simply create a demand for additional transport facilities which would have to be met by bus, tram, or train operation. This conclusion is amply proved by the rapid increase in the number of passengers carried on the railways and public road transport vehicles since rationing of petrol was introduced. On the same principle, a restriction or any particular phase of goods transport produces similar results but the effects are not so apparent as in the case of passenger transport.

The transport of goods begins in the factory and ends in the home of the consumer, *via* the wholesalers' warehouse and the retailers' shop. In reality, therefore, a cycle of operations is continually being carried on, making it very difficult to decide at what point restrictive measures can be applied without causing a slackening of economic efficiency. In normal times the repercussions resulting from suspension or curtailment of services would be an important consideration, but in times such as the present when we are living on our capital, so to speak, of supplies of rubber, oil, petrol, and vehicles, the essential quality of the services to the national economy must be the primary consideration.

Approach to Problem

Before considering the question of how individual interests will be affected, or attempting to draw up a list of essential or non-essential services, it is necessary to decide, first of all, how this problem of rationalisation should be approached. Two major issues immediately come to mind, namely:—

(i) Can any of the existing forms of transport be entirely suspended or curtailed on the grounds that they are non essential?

(ii) Is it possible to carry out essential transport on a lower operating mileage without seriously impairing efficiency in order to effect a saving in oil, petrol, and rubber tyres?

The conveyance of passengers for picnic and sight-seeing tours by public transport vehicles and the use of private motor cars for business or pleasure offer tremendous scope for economy. The cross haulage of goods traffic in urban and suburban areas, and the wasteful system of overlapping services in the conveyance of merchandise, foodstuffs and other commodities, offer a fruitful field for investigation. In addition to this, there is still a large amount of unnecessary competition occurring through

* "Some Aspects of the Problem of Rationalisation of Road Transport in South Africa"—a paper read, on July 30, by Mr. G. W. Reid, A.M.Inst.T., Acting Manager, Road Motor Services, South African Railways & Harbours Administration, before the Johannesburg & District Sub-Centre of the Institute of Transport (S.A. Centre)

passenger transport concerns running full-scale timetables, from which the conclusion is drawn that the convenience of the public is still uppermost in the minds of the operators and the public alike. Parallel road and rail services is another form of wasteful competition and in this category are included taxi operations, and long hauls of ordinary goods traffic, newspapers, and so on, by road vehicles.

Due to the ramified and complex nature of transport, any definition of indispensability of service is almost impossible in normal times, and even under the present emergent conditions, the matter is one of extreme difficulty. In the event of available supplies either of motor vehicles, petrol, oil, or rubber proving inadequate to sustain economic life at the required level, further drastic curtailment of services would be necessary. Such action would inevitably result in disorganisation with a consequent slackening of economic effort. Broadly, the predominating factor in deciding the essentiality of any transport service under the conditions envisaged above would be its value to the national economy in its relation to the war effort. This definition is, admittedly, very wide, but it provides a basis for the consideration of individual applications for essentiality certificates. Each case would have to be considered on its merits but the following examples may be helpful :—

(i) The conveyance of essential commodities for war undertakings and the like, as well as the transport of factory workers, etc., would be entitled to special consideration.

(ii) Perishable traffic and other essential commodities, the transport of which by road is necessary in maintaining the economic life of the country, would also deserve special consideration but to a lesser degree than in the example quoted in the preceding paragraph.

Factors in Transport Economics

Assuming that all aspects of wasteful transport are tackled in an effective manner by drastically curtailing public transport facilities and private motoring, and that unnecessary services, including the cross haulage of goods traffic, are completely eliminated, there remain two important factors in transport economy in relation to the conservation of supplies to be considered, namely :—

(i) The further reduction of operating mileage by utilising the " pay-load " space on vehicles to maximum capacity.

(ii) The diversion of traffic to the railways wherever possible and the use of animal drawn or other vehicles which are not dependent on petrol or rubber tyres.

What is the answer to this problem of rationalisation and what machinery must be set in motion to bring about the necessary co-ordination and control of transport for the conservation of available supplies in the national interest ?

There is no doubt that much can be accomplished by scaling down the basic petrol ration and ensuring that the supplementary mileage allowances are granted only for *bona fide* travel in the national interest. All road operations can be measured in terms of mileage, and any savings in this direction must obviously react favourably on the rubber, oil, and vehicle position. This is almost startlingly exemplified by the scaling down of the petrol ration in America where, as is well known, no shortage of petrol or oil exists. Restrictive measures have obviously been adopted solely on the grounds of conserving rubber supplies.

The Motor Carrier Transportation Act provides the necessary machinery for the control of a large portion of motor transportation in the Union. These vehicles are operated under the authorities granted by the Central Road Transportation Board and local road transport boards. Under the emergency regulations recently gazetted, additional powers have been conferred on these boards and they may now cancel or amend any motor carrier certificate or exemption in their discretion and may attach thereto any conditions which they consider to be in the interests of conservation of supplies. A mileage limitation could, for instance, be imposed as a "condition," and thus effect a saving in petrol and other supplies as already indicated.

Convenience of Public and Profits

It is certain that if substantial reductions in the total mileage previously covered by vehicles are to be effected, less consideration will have to be given to the convenience of the public and the profits of the operator than has hitherto been the case. The Central Road Transportation Board, in defining its policy in this direction, has made it very clear that stringent measures in the interests of economy will be applied to all applications for renewal of certificates or exemptions and that no new applications will be considered unless it can be shown that the service is essential. It is interesting to note that the decision to utilise existing statutory powers as far as possible in the control of transport during the war period is similar in many respects to the organisation adopted in the United Kingdom shortly after the outbreak of war. Under the latter the peacetime Chairman of the Traffic Commissioners became the Regional Transport Commissioner, responsible for the organisation of road transport, with separate offices in each area. The analogy between this organisation and that of the Central Road Transportation Board and local transport boards in the Union, functioning under increased emergency powers, is very noticeable.

All motor transportation falling outside the scope of the Act, such as private motor cars, farmers' lorries, and so on, will be dealt with through the scaling down of the basic ration of petrol and supplementary mileage allowance. These measures will undoubtedly result in considerable economies being effected and may also cause a good deal of inconvenience to the public and possible loss to certain businesses. These results are inseparable from the short supply situation which now faces the country. Enforced mileage restrictions will tend to throw the individual on to his own initiative and resourcefulness and evoke a more ready desire to share transport with his neighbours.

It is well known that a good deal of unnecessary transport of goods results from competition between merchants due to the one trying to outdo the other in service to customers. If the competitive issue could be eliminated and pooling arrangements entered into, the public could be almost as well served on a far lower basis of aggregate transport mileage. Similarly, there is room for curtailment in the frequency of deliveries of many commodities thereby imposing inconvenience but no real hardship upon the public.

To sum up, the transport boards, before deciding on the essential mileage which will be endorsed on a motor carrier certificate of exemption, will give consideration to the practicability of :—

(i) The combining of deliveries by two or more persons or firms by co-operative effort.

(ii) The zoning of delivery areas or the pooling of vehicles in order to secure the maximum use of the transport by reducing light mileage and eliminating cross haulage in the movement of goods.

(iii) By restricting the days of delivery or the number of journeys where daily deliveries are essential.

(iv) The temporary abolition of the exempted areas defined in the regulations framed under the Motor Carrier Transportation Act.

When assessing operating mileage in respect of services run to a fixed schedule for the conveyance of passengers, the following factors will be taken into consideration, namely, whether—

(i) the service can be suspended entirely;

(ii) partly withdrawn during any period of the day;

(iii) withdrawn or reduced on a Sunday;

(iv) operated on a more direct route;

(v) service curtailed to cut down empty mileage;

(vi) cutting down stopping places to a minimum.

It is also an accepted principle that vested rights will be protected and that, if the resumption of a service is found necessary after it has been cancelled, the operator concerned will be given an opportunity of re-introducing his service. The railways have taken the lead in the curtailment of travelling facilities by rail, and a comprehensive survey was recently undertaken of all road motor services in the Union. Each route was carefully examined and the frequency of schedule services reduced to actual traffic requirements and all pleasure trips for picnic parties, and so forth, eliminated. The charabanc services in the Cape Peninsula and along the Garden Route, which were an outstanding feature of tourist de luxe services in pre-war days have been entirely suspended. The curtailments in respect of road motor service schedules are estimated to save, at least, 750,000 vehicle miles a year.

An important development in Government policy in the control of road transport is the appointment of a Transportation Co-ordinating Committee, whose principal function is to consider transportation problems with a view to adopting and putting into force a co-ordinated policy directed towards the conservation of supplies. The committee has stated its objective to be the reduction of all transport facilities in the Union to a minimum consistent with maintaining the economic life of the community on a war footing. The personnel of the Committee is composed of the Controllers of Motor Vehicles, Petrol, Oil, and Rubber, the Chairman of the Central Road Transportation Board, and one representative each from the Defence Department and the South African Railways & Harbours Administration, with a full-time secretary. The policy of the committee as to rationalisation of transport is to ensure that the powers of the four controllers and the transportation boards are exercised jointly towards the common end of conserving these supplies which are vital to transport.

Publicity and propaganda designed to

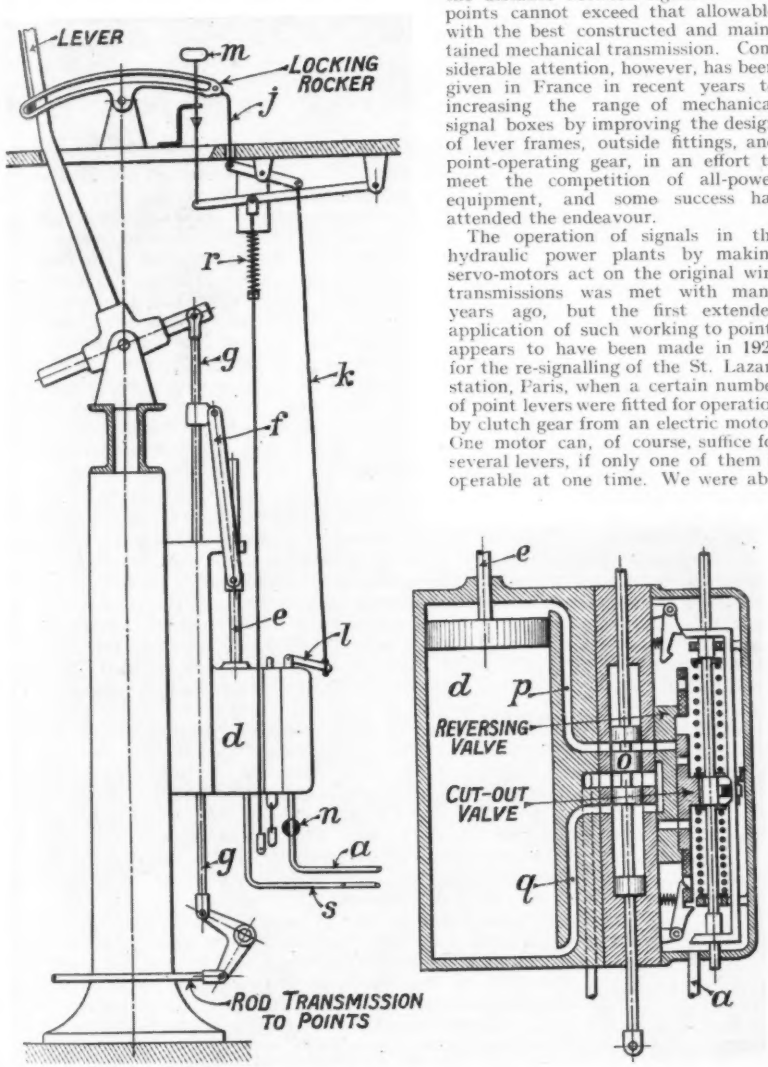
(*Continued on page* 297)

Operation of Point Levers by Servo-Motors

The French Railways make some use of servo-motors for the direct actuation of point levers in mechanical lever frames

WHEN the ordinary mechanical operation of points by a manually-operated lever does not meet all the requirements, the alternative of working by power, in whatever form may prove most convenient, with some power mechanism at the points themselves, has been the general practice in Great Britain. In the case of the hand-generator system the signalman has, of course, to put forth a certain amount of exertion as the ultimate source of power is still himself, but in all cases the ordinary mechanical equipment of rodding—or wires—between signal box and points disappears. In France, however, much use has been made of servo-motors to operate the point levers in a locking frame direct, so that the original transmission remains. This has been thought specially advantageous where, in general, mechanical signalling met the requirements but one or two pairs of points demanded somewhat more exertion than usual to operate them and had perhaps to be reversed, at certain hours at least, fairly frequently. Power operation became the normal method of working, but ordinary manual operation could still be used if any defect developed. For these arrangements to be successful the distance between signal box and points cannot exceed that allowable with the best constructed and maintained mechanical transmission. Considerable attention, however, has been given in France in recent years to increasing the range of mechanical signal boxes by improving the design of lever frames, outside fittings, and point-operating gear, in an effort to meet the competition of all-power equipment, and some success has attended the endeavour.

The operation of signals in the hydraulic power plants by making servo-motors act on the original wire transmissions was met with many years ago, but the first extended application of such working to points appears to have been made in 1929 for the re-signalling of the St. Lazare station, Paris, when a certain number of point levers were fitted for operation by clutch gear from an electric motor. One motor can, of course, suffice for several levers, if only one of them is operable at one time. We were able to see this apparatus in service, and it is understood to have continued to work satisfactorily.



Application of oil servo-motor to Saxby type lever in French signal box

Some years later the firm of Saxby, of Creil, which had carried out the St. Lazare installation, introduced a servo-motor equipment operated by oil under pressure, with the object of fitting adjacent levers, if necessary, and generally reducing the space needed. The principles of this are shown on the accompanying figure. It will, of course, be understood that any mechanical or electric locking must be applied to the catch handles, otherwise one could be lifted and the servo-motor brought into operation against a locked lever, which would be unadvisable, even assuming the effort on the lever to be no greater than a signalman could exert.

The Oil Pressure Apparatus

This consists essentially of a piston moved up and down in a cylinder by oil under pressure; the oil is taken from an accumulator at the signal box, into which it is delivered by a motor-driven pump. The accumulator is connected to the valve chambers of all the servo-motors in the box. The use of oil obviates all risk of freezing and ensures satisfactory lubrication of all the working parts.

In the figure the pipe *a* comes from the accumulator and connects with the valve chamber. The motor piston rod *e* is connected by rod *f* to the ordinary point-rod vertical lead *g*. To set the lever in motion the signalman actuates the catch handle and the locking rocker operates the distribution valve through rods *j*, *k*, and *l*. There are two slide valves, a cutout valve, and a reversing valve. The former is actuated by the catch handle, but has a trigger action control, so that it does not operate until the catch handle is fully clasped. The movements of the reversing valve depend on those of the other valve. It also has a trigger-latch action, the purpose of which is to make certain that the reversing valve cannot move while the lever is travelling, and at the same time ensures that it moves rapidly from one position to the other directly the lever reaches an extreme position, to prepare for the reverse movement.

To disconnect the servo-motor mechanism and work manually the signalman pulls the grip handle *m* against spring *r* and secures it to a stop. This closes the cock *n* and isolates the valve chamber from the oil feed, at the same time raising valve *o* so as to put the passages *p* and *q*, which lead to the main cylinder *d*, into communication with each other and the escape pipe *s*, by which in ordinary working the used oil is returned to the pump. The lever is then free to be worked as a manual point lever.

The Northern region of the French National Railways began using this apparatus in 1934 at Busigny and is understood to have extended its application since with satisfactory results.

Rationalisation of Road Transport in South Africa (*Concluded from page* 296)

educate the public and secure its collaboration in any general scheme for economy is also a function of the committee and comprehensive schemes are now being drawn up to achieve these ends. Representatives of commerce, industries, and various associations and public bodies will be called in for consultation when measures affecting sectional interests are under consideration.

The ability to carry on essential transport in South Africa during the war will depend on the vigour with which restrictive measures are enforced to conserve vital supplies, and to the wholehearted response of the public. I am convinced that as long as supplies are forthcoming transport will exert every ounce of energy and initiative to meet essential demands and that the public will accept any measures which may have to be applied.

An Alternative to Compounding—I

A general survey which includes proposals for redesigning the cylinders and valve gears of locomotives

By W. A. Tuplin, D.Sc.

A FEW years ago,* a suggestion was made that modification of the design of the G.W.R. King class locomotives on the lines of the Chapelon compounds would lead to a considerable increase in tractive power. It was pointed out, however, that the limitations of the British loading gauge make it impossible to accommodate the low-pressure cylinders which would be required for the purpose. In other words, it is impossible to build a British compound locomotive of power comparable to that of the largest existing simple engines. Now, although the highly successful design methods associated with the name of M. Chapelon have shown their most striking result in compound locomotives, they can also be applied with advantage to simple locomotives, and it may be with equally good results.

The position is similar to that which existed when the Great Western Railway was testing French-built compounds in the early years of the present century. The performances of the Nord Atlantics were outstanding at that time, but it was shown on the Great Western Railway that comparable results could be obtained from simple engines of similar dimensions and therefore that compounding was not the sole secret of success. It is interesting to speculate whether the same conclusion could be reached today, and in what follows, the question is examined with particular reference to possible development of the G.W.R. 4-cylinder design.

Advantage of Compounding

The primary object of compounding is usually assumed to be the more economical use of steam by reason of relatively high expansion ratio, and yet much of the work of the French compounds appears to be done at such late cut-offs that the overall expansion ratio is often no higher than those regularly used in single-expansion engines. The compound has an advantage in that the difference in temperature between receiver steam and exhaust steam is less than that between live steam and exhaust steam in the simple engine. Thus the quantity of heat carried away from cylinder walls and ports by exhaust steam is less in the compound than in the simple engine.

It may also be suggested that the simple engine has a disadvantage in the timing of exhaust port opening when conventional valves and valve gears are operated at early cut-off. At late cut-off, the steam is not released from the cylinder until the working stroke is nearly completed, and the exhaust port remains open, for a half-revolution of the crank if the exhaust lap is zero, until the return stroke is nearly completed. This exhaust timing is ideal for extracting the utmost work from the steam, and a compound working at (say) 60 per cent. cut-off in all cylinders approximates to it. On the other hand, with conventional valves, a cut-off of (say) 15 per cent. involves release at about 60 per cent. of the working stroke and closing of the exhaust port at 60 per cent. of the return stroke. In other words, the exhaust port is open for half a revolution of the crank, but it is not the best half. The general effect on the indicator diagram of this exhaust timing as compared with release and compression at 90 per cent. of the stroke is shown, very approximately, in Fig. 1, from which it would appear that a gain in power of the order of 15 per cent. is possible if late exhaust is combined with early cut-off.

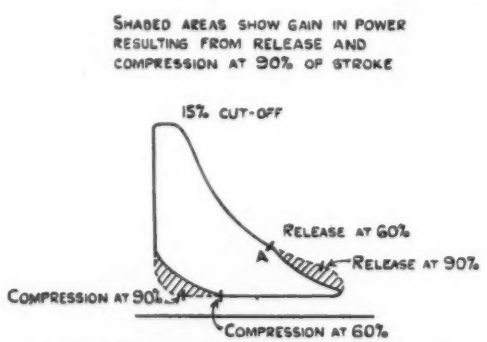


Fig. 1—Effect of change in exhaust timing on indicator diagram

The exact effect of early exhaust on the indicator diagram depends on the resistance of ports and passages to the flow of exhaust steam, and on the speed of rotation, and it is surprising to realise that a very free exhaust may cause more loss than a restricted one because of more rapid fall of pressure to the right of the point *A*. The ideal would appear to be the combination of late exhaust with free exhaust passages, and this is found in the Chapelon compounds when working hard.

Independent Inlet and Exhaust

Separate valves for admission and exhaust can achieve the desired exhaust valve timing at all cut-offs and they also reduce the loss due to temperature difference between inlet steam and exhaust steam, because the valves and valve liners, where the steam comes most closely into contact with metal, are maintained at different temperatures. Cam-operated poppet valves with independent inlet and exhaust are in service in this and other countries. A new development in this direction has made its appearance lately and this has been fitted on a locomotive of one of the railways in this country. The alternative possibility of using separate piston valves for admission and exhaust, and of operating them by separate valve gears of conventional type also exists. This would achieve the desired result with the minimum departure from widely accepted practice.

Valve Gears

The use of four sets of valve gear in a two-cylinder engine would appear to be an embarrassment of riches, but four sets of gear with rocking levers would suffice for a four-cylinder engine with cranks at right angles, and the proposal in that case appears less extravagant. It should also be remembered that the fitting of four sets of valve gear is universal in four-cylinder compounds on the Continent, and that it is found in one class of four-cylinder four-beat simple engines in this country. In this proposal, the four sets of valve gear might be identical, and the two sets used for admission notched up for expansive working in the usual way ; the two sets operating the exhaust valves would remain in the full-gear position continuously. By this means the cut-off could be brought back to (say) 10 per cent, with exhaust and compression each at (say) 90 per cent. The inner edges of both admission and exhaust valves would be used for closing the ports so that the end spaces of the valve chests would not take either live steam or exhaust steam.

Not only does the use of separate valves for admission and exhaust provide the desirable independence of valve-events, it also makes possible the use of shorter exhaust paths from the ports to the blast-pipe than can be provided with the conventional valve arrangements. To reduce conflict between converging streams of exhaust steam through the ports and to direct the steam towards the exit from the valve-chest, it is suggested that the spindles of the exhaust valves should be fitted with deflector plates as in Fig. 2.

The advantage of short, direct exhaust passages, particularly where high speeds are concerned, has been demonstrated and is fully acknowledged, and yet the principle is not always put into effect. The four-cylinder arrangement standard on the Great Western Railway places the inside cylinders well ahead of the outside ones, and as all the cylinders discharge into one blast pipe, long exhaust passages are inevitable. If, however, the principle of using two blast pipes is accepted (and Chapelon designs show its advantage) this defect may be avoided.

One blast pipe may be placed immediately above the inside cylinders, and the other one as close as convenient to those

* See THE RAILWAY GAZETTE of February 18, 1938, page 296

outside ; with cranks at right angles, the exhausts from inside and outside cylinders occur simultaneously and so there is no danger that draught induced by blast in one chimney will be impaired by the presence of the other chimney. To bring all the exhaust together into one pipe, and then to separate them in a double chimney seems illogical. Moreover, it is possible that two blast pipes comparatively widely separated will be more effective in inducing draught than if they were placed as closely together as branching from a single exhaust pipe makes necessary.

To prevent conflict between the vortices created by the two blast-pipes and to improve the distribution of draught over

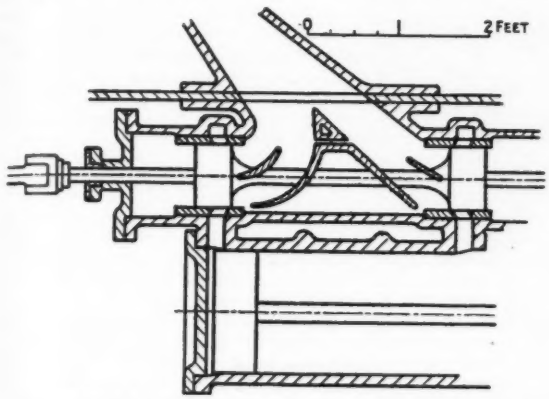


Fig. 2—Section showing exhaust paths from outside cylinders

the tube-plate, two easily removable vertical baffle-plates would be used. In plan these would form a forward-pointing V with the vertex just behind the leading chimney.

In the Chapelon four-cylinder compounds, the exhaust from the low pressure cylinders passes directly into the blast pipes. In a four-cylinder simple with separate chimneys the inside cylinders have exhaust arrangements as efficient as those of the compound. The outside cylinders are naturally less favourably situated, but the use of separate exhaust valves placed closely against the frame plates permits of appreciably shorter exhaust paths than are possible in the conventional

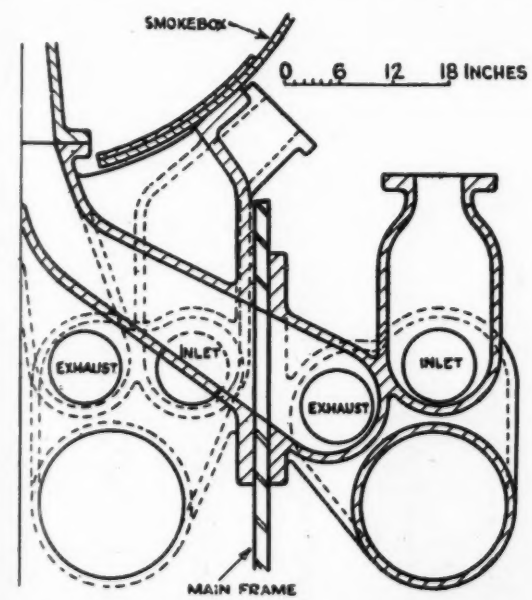


Fig. 3—Section showing disposition of valves and cylinders

outside cylinder arrangement (see Fig. 3). It seems, indeed, that a four-cylinder engine designed on these lines would be appreciably more efficient when working with early cut-off at high speeds than any existing simple locomotive with conventional piston valves.

Admission of Steam to Cylinder

The foregoing argument is concerned largely with the movements of exhaust steam, because there is normally more room for improvement in that respect than in the conditions of admission of steam to the cylinder. If and when such improvement has been made, however, admission may well come under review. In order that the working stroke shall at least be commenced at full steam-chest pressure, the admission port is opened before the end of the exhaust stroke of the piston. The amount of this " pre-admission " is usually indicated by specifying the lead of the valve, although a more significant definition is that of the crank angle at admission. Similarly, the position of the point of cut-off, usually specified as occurring at some particular fraction of the working stroke, may be described by the corresponding crank angle.

Now if these angles are decided on, the maximum admission port opening is a fixed fraction of the valve travel, assuming that the motion of the valve is, as usual, approximately simple harmonic. For example, with a valve travel of 4 in., zero lead, and 10 per cent. cut-off, the maximum port opening is 0·1 in. If the lead, instead of being zero, is such as to open the port at 20° before the dead centre, the maximum opening is 0·24 in. For a given valve travel the maximum port opening at any cut-off is increased by making admission earlier, but this is a disadvantage if it causes the cylinder pressure to reach steam chest pressure before the end of the exhaust stroke. Whether it does so or not depends on dimensions of valves and ports in relation to those of the cylinder, and upon the piston speed. Here, again, ample port sections may, therefore, be disadvantageous, unless the lead (or more significantly, the pre-admission angle) is kept small.

Now, taking a piston valve of 8 in. dia. and allowing 4 in. of circumference for bars across the ports, the cross-sectional area of the port at maximum opening of 0·25 in. would not exceed about 5·2 sq. in. and the ratio between this and the area of a 16½ in. dia. piston (as in the G.W.R. " King ") is about 40. In the P.O. Chapelon compound 4-8-0, the ratio is 13·5 in the high-pressure cylinders at 30 per cent. cut-off and 9·5 in the low-pressure cylinders at 40 per cent. cut-off. Taking the clearance volume as 12½ per cent. of the swept volume in the simple engine, the overall expansion ratio is about 5 in each case. Thus at equal overall expansion ratios, this particular compound engine has a big advantage in freedom of admission of steam to the cylinders, and the simple, with normal piston valves and valve gear, could not effectively compete at high speeds unless, of course, the valve travel was very much longer than anything used at present.

(To be continued)

SOUTHERN RAILWAY AIDS PAPER SALVAGE.—Working in close co-operation with the Waste Paper Recovery Association, the Southern Railway is making vital contributions to the national campaign to save paper for munitions of war. Tickets are now being printed 39 to the inch in bulk, as compared with 32 to the inch in bulk in pre-war days, and this effects a saving of 500 tons of paper a year. Stamp headed rough paper cut from old posters is used for internal correspondence and train time sheets. Office note pads are made of cut-up posters instead of the pre-war art white paper with millboard back. Multiple-use envelopes are now used, enabling four journeys to be made and also old envelopes to be used many times with a gummed slip pasted over the original address. All the Southern Railway bill-boards have the old bills stripped from them regularly and the scrapings are put into special bins for salvage. In peacetime two types of staff privilege ticket forms were used, one for local travel and the other for use on the lines of other companies. These have now been standardised on one form and the size reduced. Waste paper from offices and departments sent to waste paper depots in 1939 was 665 tons, in 1940, 1,160 tons, and in 1941, 1,200 tons; and in each of 1940 and 1941 the company reclaimed 100 tons for further office use in other ways.

Streamline Development in the United States—II

The streamlining of locomotives has resulted in a popularity reflected in substantial earnings

THE methods of streamlining applied to American locomotives, some modern examples of which appear on pp. 301 and 302, are of considerable interest. Full aerodynamical streamlining has not been tried to any large extent, as it is felt that the increase in maintenance costs due to the inaccessibility of working parts under a completely streamlined shroud offsets the minor economy effected by reducing head-end air resistance to a minimum, and so slightly cutting down fuel consumption. A further disadvantage is that the characteristic appeal of the locomotive is lessened when the revolving wheels and motion are almost completely concealed, and there is no question that propaganda has played a large part, if not the major part, in American streamlining methods. The Pennsylvania 6-4-4-6 locomotive, illustrated on the next page, was streamlined in consultation with the well-known design firm of Raymond Loewy, and is the most complete example; of this the bullet nose, carrying the headlight at the centre, is a prominent feature; the modern version of the cowcatcher, compulsory according to American law, projects like an apron in front, and straight gold lines are carried down the length of engine and tender on a background of Tuscan red, the standard Pennsylvania rolling stock colour. The Milwaukee 4-6-4, used on the very fast Hiawatha services, represents an intermediate stage, and is the most beautiful and graceful example of the three; the design collaborator in this case was Otto Kahn. In this the rounded nose forms one practically unbroken line from chimney level to rail level, inclined at an angle of about 30 deg. from the vertical, and various decorative devices in front are carried round to the side of the engine. The side sheathing is lifted to expose the wheels and motion, and drops again below the cab. As to colour, the nose and boiler casing are a bright orange shade, and a band of crimson, starting at the cylinders, spreads out to cover the cab and tender entirely, and is then carried down the train, with relief in gold lining. The Southern Pacific 4-8-4, used on the Daylight and other streamline services, has the boiler mountings cased in; a conically shaped smokebox door which carries the headlight and has a light aluminium finish; and finally sheet steel panels which begin at the two sides of the apron, rise over the cylinders, and sweep down both sides of the boiler, above the wheels, to the cab. This panel is a brilliant orange shade, and it continues in a straight line along the tender and train; the colour above and below is a bright harmonising shade of red. The Norfolk & Western 4-8-4 has a similar casing for the boiler mountings, but little actual streamlining; the bullet nose and apron resemble the Pennsylvania arrangement but are blunter, and louvres above the smokebox (a common feature of American streamlining) provide for the lifting of the exhaust above the cab. The "Twentieth Century" New York Central 4-6-4 has even less true streamlining, but a startling effect is produced by the great vertical fin, with the headlight in the centre, which comes round the bullet nose at the head end, and has to do with exhaust lifting in addition to its decorative effort. The driving wheels of this locomotive, which are of a modified Boxpok type, have a curious appearance, as also the irregularly-shaped display plate extending forwards from the front of the cab. In appearance this engine suffers somewhat by the cumbrous appearance of its enormous twelve-wheel tender, with side sheets extending almost down to rail level. A later version of this type is seen in the striking example attached to the Empire State Express.

Streamline Train Earnings

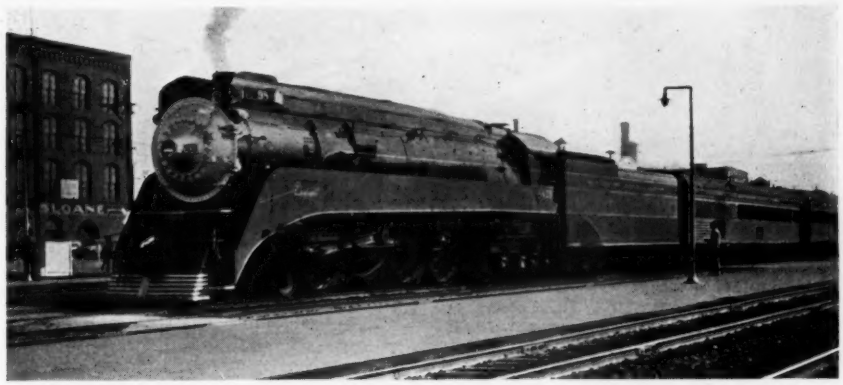
Some remarkable figures as to the earnings of some of the principal streamline trains in the United States have been made public. The Champion of the Atlantic Coast Line RR., an all-coach diesel-hauled train between New York and Miami, earned $2.60 per mile when operated with seven cars, but on the doubling of the train to 14 cars, with two power units, the earnings rose to $5.34 a mile. The Rocket diesel streamliners of the Rock Island & Pacific are computed to have earned 36 per cent. on the original investment; the Rocky Mountain Rocket, which cost $887,481, has earned a net annual average income of $430,550, or 48 per cent. of the original investment. Since The 400 of the Chicago & North Western was turned over from standard equipment and steam power fo new streamline trains with diesel power on September 24, 1939, patronage has gone up by 58 per cent. The steam-hauled Hiawatha of the competing Milwaukee route has done just as well; indeed, in August, 1941, the 38,472 passengers carried by both Afternoon Hiawathas was a record, and during the same month the Morning Hiawatha services also carried 22,456 passengers. The Daylight services of the Southern Pacific between Los Angeles and San Francisco, twice daily in each direction, have also created some notable records for long-distance passenger patronage. In the first four years of their operation the Morning Daylights carried 1,309,342 passengers, and the Noon Daylights, which appeared three years after the morning trains, carried 198,822 passengers in their first year over this 470-mile route. In the Eastern States the Mercury streamline steam service of the New York Central, doubled in 1940, and extended

TABLE II—PASSENGER AND NET REVENUE STATISTICS, UNITED STATES STREAMLINED TRAINS, 1940 AND 1941

Railway	Train	Power	Minimum No. of cars ¶	Formation‡	Average passengers a trip	Net revenue a mile		Time of journey
						1941	1940	
						$	$	
Atlantic Coast-Florida East Coast.-Penn.	Champion	Diesel	14	C	362	5.34	2.54	Night
Milwaukee	Afternoon Hiawatha	Steam	8	PC	376	3.87	3.79	Day
C.N.W.-U.P.-Southern Pacific	City of San Francisco	Diesel	14	PSC*	141	3.80	3.49	Night†
Chicago & North Western	The 400	Diesel	10	PC	330	3.72	3.24	Day
New York Central	Mercury (2)	Steam	8	PC	364	3.68	3.38	Day
Seaboard-Pennsylvania	Silver Meteor	Diesel	17	PSC	293	3.54	1.78	Night
Milwaukee	Morning Hiawatha	Steam	11	PC	237	3.41	3.20	Day
C.N.W.-Union Pacific	City of Los Angeles	Diesel	14	PSC*	142	3.30	2.76	Night†
Burlington	Denver Zephyr	Diesel	12	PSC	215	2.77	2.74	Night
C.N.W.-Union Pacific	City of Denver	Diesel	11	PSC	151	2.52	2.40	Night
New York Central	Twentieth Century Ltd.	Steam	12	PS*	64	2.50	2.61	Night
Illinois Central-C. of G.-A.C.-F.E.C.	City of Miami	Diesel	7	C	170	2.22	—	Night
Burlington	Twin City Zephyrs (2)	Diesel	7	PC	168	2.05	1.82	Day
New York Central	James Whitcomb Riley	Steam	7	C	139	2.03	—	Day
Missouri Pacific	Missouri River Eagle	Diesel	6	PSC	222	1.92	1.81	Night
Rock Island	Des Moines Rocket	Diesel	4	C	172	1.82	1.82	Day
C.N.W.-Union Pacific	City of Portland	Diesel	9	PSC	101	1.76	1.69	Night†
Rock Island	Peoria Rocket	Diesel	4	C	99	1.71	1.67	Day
Rock Island	Arizona Limited	Diesel	7	PS*	54	1.49	—	Night†
Burlington	Texas Zephyr	Diesel	8	PSC	54	1.41	—	Night
Rock Island	Rocky Mountain Rocket	Diesel	7	PSC	182	1.26	1.20	Night
Chicago, North Shore & Milwaukee	Electroliners (2)	Electric	4	C	120	1.24	—	Day
Illinois Central	Green Diamond	Diesel	4	C	92	1.22	1.46	Day
Rock Island	Kansas City-Dallas Rocket	Diesel	4	C	153	1.17	1.04	Day
Burlington	Silver Streak Zephyr	Diesel	3	PC	77	1.14	1.02	Day

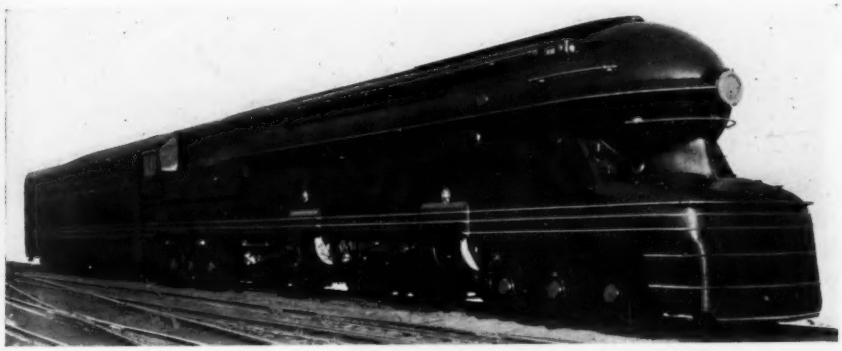
* Extra fare train † Two consecutive nights on journey ‡ P : Parlour cars PS : Pullman sleeping cars C : Coaches ¶ Excluding power cars

from its previous Cleveland—Detroit run to Chicago, carried 266,008 passengers in the first year of this extended operation, and earned a gross revenue of $1,125,425. The same company's all-coach Pacemaker, a 17-hr. steam-hauled train on the New York—Chicago service, was re-equipped last year with new lightweight stock, as a result of which passenger patronage rose from 114,095 in 1940 to 167,454 in 1941, or by 47 per cent., and the revenue per train mile from $2.18 to $2.74. The competing all-coach Trail Blazer of the Pennsylvania similarly increased its passenger complement from 132,000 in 1940 to 175,000 in 1941, and on 53 days in 1941 more than 500 passengers were carried, duplication and even triplication being frequently needed.



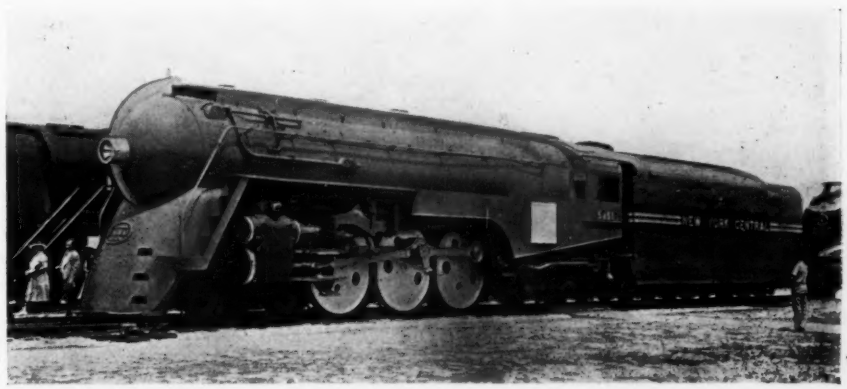
The Daylight Limited, streamline 4–8–4 locomotive No. 4420, Southern Pacific Railroad

of competing trains between Chicago and St. Louis; the Twentieth Century Limited of the New York Central also shows a slight decline. Some impression of the luxury of this and certain other extra fare trains is conveyed by the fact that the average passenger complement in a 12-car formation is only 64, notwithstanding which a net revenue of $2.50 per mile is earned. It will be seen that the earnings of a number of streamline steam services, and in particular the Hiawatha trains of the Milwaukee and the Mercury trains of the New York Central, rank equally with the best figures of the diesel streamliners. One Hiawatha working in each direction has since been turned over from steam to diesel operation, and it will be interesting to see what effect this change has on net revenue. The Champion of the Atlantic Coast and Florida East Coast Railroads, earning $141,830 per train per month, easily heads the list; each of the City of Los Angeles and Denver Zephyr trains earns $86,335 and $86,175 per month respectively.



Experimental 6–4–4–6 express locomotive, Pennsylvania Railroad

Table II shows the earnings during 1941, as compared with those of 1940, of a number of the best-known streamline trains in the United States. In every case but two these earnings have increased; the chief exception was the Green Diamond of the Illinois Central, which is one of a number



New York Central 4–6–4 locomotive No. 5451, as used on the Twentieth Century Limited

The Tennessean, streamline diesel train of the Southern RR. between Washington and Memphis, being hauled over Lynchburg–Bristol section by Norfolk & Western RR. streamline 4–8–4 steam locomotive

The Hiawatha express of the Chicago, Milwaukee, St. Paul & Pacific RR. leaving Milwaukee, headed by one of the 4–6–4 streamline locomotives specially designed for working heavy high-speed trains

The Empire State Express, running between New York, Buffalo, and Detroit, New York Central System, with streamline 4–6–4 locomotive

STREAMLINE DEVELOPMENT IN THE UNITED STATES—II

(*see pages* 300–301)

RAILWAY NEWS SECTION

PERSONAL

The King has recently awarded the Imperial Service Medal to 86 employees of the Department of Transport, Canada.

Mr. I. F. L. Elliott, who has been Commercial Director of the British Iron & Steel Federation and Managing Director of the British Iron & Steel Corporation since November, 1935, has ceased to hold these offices.

Mr. Christopher Edward Spurgeon, Deputy General Manager, Egyptian State Railways, has been made a Commander of the Civil Division of the Order of the British Empire. The Fourth Supplement to *The London Gazette* of September 8 in recording the honour states that Mr. Spurgeon is intimately connected with all British moves of stores and personnel and his experience of and advice on constructional and operational matters are of the utmost value. The working of the railway side of movements and transport in the Middle East is made considerably easier by his unfailing and willing co-operation. He has rendered invaluable services to the British Forces in Egypt.

COLONIAL RAILWAY APPOINTMENT

The Secretary of State for the Colonies recently has approved the following appointment:—

Mr. G. O. Urion, District Running Superintendent, to be Assistant Chief Mechanical Engineer, Nigerian Railway.

The following changes to become effective on October 1 are announced by the board of Turner & Newall Limited:—Mr. B. E. Williams, on retirement from business, relinquishes the appointment of Joint Managing Director, but remains an ordinary Director of the company; Mr. W. W. F. Shepherd, at present Joint Managing Director, becomes Deputy Chairman; Messrs. Harry Hanson, Ronald Gray Soothill, and George Wilson are appointed Directors. The three new Directors are all actively engaged in the company's business, with which they have been associated for many years.

We regret to record the death of Mr. William Arthur Powell, Assistant London District Freight Superintendent, Southern Railway, on September 5, at the age of 61. His funeral took place at Shirley on September 9, when, in addition to representatives of various officers of the company and officials of many departments, there were present also members of the clerical and uniform staffs from London Goods Depots. Mr. Powell entered the service of the S.E.C.R. in 1895 at Bricklayers Arms Depot, and eventually transferred to the General Manager's Office, and on the amalgamation of the railways was attached to the General Manager's Office of the Southern Railway. He was subsequently transferred to the London East Divisional Commercial Manager's Office, becoming Chief Clerk in the London District Freight Superintendent's Office in January, 1931, in which position he remained until January, 1939, when he took up the appointment he was occupying at the time of his death.

The Hon. Frederic Claud Sturrock, the South African Minister of Railways & Harbours, who is at present on a visit to this country, was born in 1882. He served his apprenticeship as an engineer in Scotland and became an engineer on the staff of the Dundee Tramway Company on completion of his articles. He went out to South Africa in 1907, where he purchased the engineering business of Wm. Blane & Sons in Johannesburg. He was also engaged in the coal trade in the Union, and was at one time President of the Association of Chambers of Commerce of South Africa, and a member of the Education Administration Commission. Mr. Sturrock is M.P. for Johannesburg (Turffontein); he was Minister without Portfolio, 1937–38, and has been Minister of Railways & Harbours since September, 1939. He is a member of the United Party. Mr. Sturrock arrived in London on August 20, and on August 28 was received by the King at Buckingham Palace. On September 4, he was entertained at a luncheon given for him by Mr. S. F. Waterson, at which the guests included Lord Leathers, the Minister of War Transport.

The Hon. F. C. Sturrock

Minister of Railways & Harbours in the Union of South Africa

Elliott] *[& Fry*

Colonel C. H. Hamilton, O.B.E.

Director of Port & Shipping, Cape Town, Port Elizabeth, and East London, South African Railways & Harbours

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Colonel C. H. Hamilton, O.B.E., Director of Port & Shipping, Cape Town, Port Elizabeth, and East London, South African Railways & Harbours, who is accompanying Mr. Sturrock, entered the former Natal Government Railways in 1902. In 1921 he became Private Secretary to the then General Manager, Sir William Hoy, and in 1927 he was appointed Tourist Agent at Cape Town, and then, in 1929, Director of the Publicity & Travel Bureau in New York. He returned to South Africa in 1931 as Operating Assistant, Cape Town. In 1935 he became Superintendent (Operating & Commercial), Kimberley, and in 1936 Superintendent (Staff), General Manager's Office, Johannesburg. He returned to Kimberley in 1938 as System Manager, and, in January, 1940, he was transferred to Pretoria in the same capacity. Later the same year he was appointed Chairman, South African Railways & Harbours Service Commission, and shortly afterwards was seconded to the Defence Department as Director of Transport. He served on the staff of the Director-General of Transportation, Middle East, before receiving the appointment of Director of Port & Shipping, Cape Town. Colonel Hamilton was awarded the O.B.E. for services rendered in 1918 as Honorary Organising Secretary of the railway campaign by which £70,000 was raised for the Governor-General's Fund.

British Railways and the War—111

Manchester Exchange Station showing 1940 *air raid damage viewed from No.* 1 *platform*

The same scene after clearance and part restoration
(See notes on opposite page)

TRANSPORT SERVICES AND THE WAR—158

Civilian Air Raid Casualties in August

The Ministry of Home Security has announced the following figures of civilian casualties due to air raids in the United Kingdom during the month of August :—

Killed (or missing and believed killed)	403
Injured and detained in hospital	509

The casualties are classified as follow :—

	Men	Women	Children under 16	Unclassified
Killed (or missing believed killed) ...	154	184	57	8
Injured and detained in hospital ...	215	232	62	—

Revised figures have also been issued in respect of July. These represent some increase in the numbers published at page 209 of our August 28 issue.

	Men	Women	Children under 16	Unclassified
Killed (or missing believed killed) ...	206	164	40	1
Injured and detained in hospital ...	567	248	56	—

Air Raids and Passenger Trains

It has recently been announced officially that 50 passenger trains have been lost in enemy air attacks on Great Britain.

Restricted Transport of Onions

The Minister of Food has issued directions under the Food (Transport) Order restricting from September 14 the transport of onions by rail and road. The free movement of onions by rail is allowed within any one of 11 areas, but no movement by rail may take place out of any such area (subject to certain exceptions in the case of the growing area around Peterborough). Road transport is permitted only for distances up to 40 miles in a straight line from the point of origin to the point of delivery.

Government Road Fleets

Abolition or drastic reduction of fleets of lorries which are being operated by various Government departments other than the Ministry of War Transport was suggested recently in a speech at Halifax by Councillor Charles Holdsworth, a Member of the Road Haulage (Operations) Advisory Committee. He said that at the present time the Ministry of Aircraft Production alone was operating 5,000 vehicles over which no one else had any control, and the Ministry of Supply and the Admiralty each had a large number of vehicles operating on the same basis. It had been definitely stated by the Ministry of War Transport and repeatedly emphasised by the Advisory Committee that the Government road haulage scheme would not work satisfactorily unless all departments using road haulage were prepared to put their traffic through the Ministry.

Loan of Buses

Stockton Corporation Transport Department is considering hiring double-deck buses from the London Passenger Transport Board. If this course is adopted, it is expected that single-deck buses hired from the Yorkshire Woollen District Transport Co. Ltd. will be returned.

In recent months there has been considerable flexibility in the transfer of vehicles from one part of the country to another under hiring arrangements, to an extent which has provided many of the advantages of a pool of rolling stock. Thus, trolleybuses from Brighton may be seen working in Newcastle Corporation service, and double-deck buses from the East Kent Road Car Co. Ltd. and the London Passenger Transport Board are encountered in railway-associated service on many rural routes in the North of England which have attained wartime importance.

Railwaymen in the Forces

To date, some 95,000 British railwaymen have been released to join the Forces.

Manchester Air Raid Damage

Exchange Station.—During the raids by enemy aircraft on Manchester in December, 1940, the station buildings and offices at Exchange Station were hit and burned out by H.E. and incendiary bombs, a portion of an underbridge was badly damaged, and a 21 in. dia. cast-iron column supporting the roof was destroyed. A portion of the roof, which has a span of 70 ft., collapsed, and all lines were blocked by debris and damaged stock; this part of the station had to be closed. Work was first directed to clearing the through lines and removing insecure and dangerous portions of the roof and walls. A few days later two platform lines and the down through road were all clear for through traffic; a week later the station was reopened for limited use, and afterwards part of another platform line was cleared of debris and damaged stock and opened for trains. Extensive use of oxy-acetylene cutters was made to free the tangled mass of roof principals, etc. The reconstruction of the underbridge, which, with a span of 60 ft., bridged a main public thoroughfare and supported a platform and approach road, was quickly put in hand. Temporary trestling was erected under it to prevent further collapse, two suitable girders were found, and, after the damaged section had been cut away and removed, they were erected in position by the use of a 15-ton steam crane. The cast-iron column was replaced by a 13 in. × 12 in. plated steel stanchion and the platform carried by the bridge was restored with precast concrete slabs. In a short time the platform was again in use. Demolition of the dangerous walls of the station buildings was effected by the use of wire ropes and a D.8 Bullnose caterpillar tractor. The state of the walls was so dangerous that a telescopic fire escape was obtained from the Corporation, and the wire cable looped round the brickwork by men working on the escape ladders. Until these walls had been demolished, passengers entered and left this portion of the station by an emergency entrance and exit, but three months later the usual means of access were available; a further platform wall had also been restored and concrete copings and flagging laid, enabling this platform line to be opened (*See illustrations opposite*).

Victoria Station.—During a further raid, Victoria Station buildings were badly damaged by H.E. and incendiary bombs. The roofs over six platforms were destroyed, the underground Control Shelter on a platform received a near miss, and offices adjacent to this platform were gutted. The permanent way in the station was distorted, and water tanks and mains fractured. Six platforms were closed for some days after the bombing, until the removal of debris and repairing of the permanent way had been so far advanced that two platforms could be reopened. Soon afterwards two more platforms were available. Two platform lines were retained for the use of the Engineer in connection with repair work. A considerable amount of girder work in the bays of the roof had to be taken down, and other portions cleared of hanging wrought-iron principal members, etc.; the cutting was effected by oxy-acetylene plant. A Military unit-trestle was used to support a section of the roof girderwork. The cellars and basements of gutted buildings and an inclined approach to a platform from the low level were filled in to platform level with debris, and surfaced with ashes to restore a circulating area to the platforms. Some cast-iron columns supporting the roof had fractured by the heat and were strengthened by fixing M.S. straps around their cracked sections. Owing to their situation, the derelict walls of the station buildings had to be taken down by hand from steel scaffolding. At the top of one structure the framework of a steel dome remained intact, but supported in a precarious position on shattered walls. It was lowered gradually by jacking from the scaffolding in conjunction with the demolition of the walls, until it was at a safe height to be cut into small sections by flame cutters.

L.N.E.R. Fuel Economy

Mr. C. H. Newton, Chief General Manager of the L.N.E.R., has just issued a circular to all members of the L.N.E.R. staff on the subject of fuel economy. It states as follows :—

"The reasons why it is of such vital importance to the nation to save coal have been so clearly emphasised in Parliament and the press that they need not be repeated. The definite responsibility which rests on every member of the community in this matter has, however, a special meaning for railways, and I want to ask for the active co-operation of the company's staff.

"In an average year we use on the L.N.E.R. between 4 and 5 million tons of coal, the bulk of which, of course, goes into the locomotive fireboxes. The heavy demands of wartime traffics naturally tend to increase the total consumption, and it is all the more important that the utmost possible value should be extracted from every ton used. A saving of as little as one pound of coal for every mile worked by our engines would mean a total economy of over 70,000 tons of coal a year. I believe that with a little extra ingenuity, our drivers and firemen can save that pound per mile or even more, and thus make a most valuable contribution to the national war effort.

"There are many other ways in which fuel can be saved, for example, in the boiler fires in our workshops, power stations, and hotels, or in our office grates. There is no need to specify the means by which fuel used for such purposes can be saved—the person responsible for looking after the fire is usually the best authority—but I merely want to stress the point that however small the saving, if it is only a shovelful here or a bucketful there, it is helping to win the war.

"It is not only the actual consumption of coal and coke which represents the fuel required for railway purposes. We use over 100 million units of electricity, 975 million cubic feet of gas, and nearly 9,000 million gallons of water, per annum, all of which of course require the consumption of a considerable amount of fuel. There are many ways in which lighting, heating, and water can be saved, but here again the savings are mainly dependent on the vigilance of each individual member of the staff. To switch off one unnecessary light or gas-jet, or to turn off one running tap, are small things in themselves, but multiplied many times a

day will produce a saving in fuel which can be usefully employed for essential war purposes.

"If any member of the staff has any suggestion to make whereby fuel can be saved, and will put it forward through the proper channel, he will be doing a service to his country. It is mainly by individual effort that the problem of fuel supply—one of the many difficult tasks confronting us at the present moment—can be satisactorily solved."

Conveyance of Explosives by Road

An Order made jointly by the Admiralty, the War Office, the Air Ministry, the Ministry of Supply, and the Ministry of Aircraft Production, has just been issued under the title of the Conveyance of Government Explosives by Road Regulations, 1942. The Order states that no steam-driven or producer-gas propelled road vehicle may be used for the carriage of explosives. Great care must also be taken to ensure that the load does not exceed 6,000 lb. net. Precautions must be made for protection against weather, theft, or sabotage, and loads must be marked clearly with labels as well as with special marks required by any particular Service Regulation. Explosives of one group may not be loaded with those of another, except in certain specified categories. Loading must proceed without interruption and the engine of the vehicle must be stopped during this period. Inspection of the vehicle is ordered to see that the insulation between the accumulators and the switchboard is sound and that there are no leaks in the tank, fuel pipe, or carburettor. At the end of the first ten miles, and at the end of every subsequent hour, the vehicle must be stopped for a general inspection as to security of load and general condition of the vehicle. The driver and one other person, who must be over 18 years of age in both cases, and over 21 in one case, must be in attendance, and may not smoke on or around the vehicle, or carry matches, lighters, or smoking materials. When two or more vehicles are carrying explosives together, a distance between them of at least 75 yards must be maintained.

Restrictions on German Producer-Gas Lorries

By a Decree of the German Minister of Transport, published in the *Kölnischer Zeitung* of August 15, lorries with producer-gas generators may not be used in factories or parts of factories where there are stores of petrol or other inflammable liquids, or where there is the possibility of explosive gases or dust. The Decree also contains regulations limiting the transport by producer-gas lorries of certain materials and liquids.

Producer-Gas in France

The number of French producer-gas vehicles using charcoal is stated to have risen from 7,000 in 1938 to almost 100,000 in 1942. Production of charcoal has been increased fourfold and special plans for the distribution of charcoal and other solid fuel became effective in June. A subsidy up to 75 per cent. of the cost of conversion is granted in respect of gas generators used by tugs and barges on the inland waterways.

Trolleybuses in Germany

An important German transport programme is to increase the number of trolleybuses in the cities of the Rhine and Ruhr, and other regions. In Berlin, for example, it is stated that heavy motor-buses are being replaced by light metal trolleybuses.

German Tourist Traffic

The available accommodation in health and holiday resorts in Germany is now stated to be only half what it was in peace-time. This year 87 per cent. of the guests in holiday resorts have been soldiers on leave from the Front, other members of the Armed Forces, and workers engaged on important war work, with their families.

Road Transport for German Local Traffic

The Reichsbahn is understood to have expressed the view recently that it would prove of great assistance if road transport could take over all goods transport for distances up to 20 km. (say, 12½ miles). To facilitate this, a new campaign has been launched for expediting the loading and unloading of lorries. With the transport of goods by road over short distances, the total time taken for loading, unloading, waiting, and so forth, is much greater than the time employed for actual transport, and the object of the campaign is to reduce this time to the minimum.

Important New Syrian Railway

Some further information is now available for publication concerning the important strategic standard-gauge railway which is being constructed from Haifa (Palestine) to Tripoli (Syria), which will link on the uniform gauge of 4 ft. 8½ in. the railway systems of Egypt and Palestine on the one hand with Syria, Turkey, and Iraq on the other.

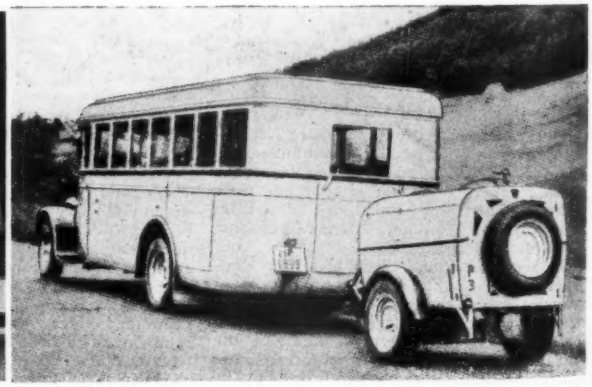
The section which was brought into service at the beginning of September extends from the northern standard-gauge terminus of the Palestine Railways at Haifa, for a distance of more than 100 miles along the coast of Phœnicia to Beirut. The project, which would ordinarily have taken about two years to undertake, was completed in nine months by engineers from Africa, Australia, and New Zealand, employing 3,000 men working in 24-hour shifts and using materials from India, Burma, the U.S.A., and Turkey. The new railway skirts Acre (the Crusader fortress which was taken by Richard Cœur de Lion), and reaches the frontier between Palestine and Syria at the Ladder of Tyre (famous for the exploit of Alexander the Great). On the other side of the headland the railway enters the Lebanon and proceeds *via* Tyre and Sidon to Beirut. In a B.B.C. broadcast on September 12 it was stated that the further extension to Tripoli in Syria involved about 120 miles of line, which is well in hand.

Earlier reference to this railway was made at page 314 of our issue of February 27 last, when it was pointed out that survey work was not begun until the Vichy Government was ousted from Syria in July, 1941. The northern section of the route (which is not yet complete) traverses country of which about four-fifths is solid rock. South African officers, who in civil life are tunnelling experts in their own country, recommended that a tunnelling company should be raised from South African miners, and General Smuts granted permission for this in accordance with the decision that non-combatant South Africans may serve outside Africa. He also agreed that South African railway construction companies, which were better equipped to undertake the constructional work involved than any other similar units in the Middle East, might be employed in building a special Syrian section of the line.

Suez Canal Railway Bridge

Another Middle East railway construction work to which we made reference last February, was the erection of a steel swing bridge across the Suez Canal similar to the bridge built across the Canal in the last war, but dismantled after the last war in accordance with the decision of the Canal authorities. It was reported from Cairo in August that this swing bridge is now in service, and that for the first time passenger trains are running across the Suez Canal from Egypt to Palestine. In addition to linking Western Egypt with the Sinai Desert line from Kantara to Palestine, the swing bridge across the Canal is stated to

Charcoal-gas generator mounted on an American-built lorry in Germany



Wood-gas generator arranged as a compact trailer to a Swiss bus

connect with the new railway line which runs on the east side of the Canal from Kantara down to Suez Roads.

Alternative Fuels in Brazil

By reason of the shortage of liquid fuels, increased attention is being given to the manufacture of producer-gas equipments for road vehicles and agricultural tractors in Brazil, but a limiting factor at the moment is the necessity of obtaining steel for the plants from the U.S.A. Production of industrial alcohol from sugar is being speeded up, and a mixture of 50 per cent. of this alcohol and 50 per cent. of petrol is now being used in lorries and buses in Rio de Janeiro; previously a mixture of 30 per cent. alcohol and 70 per cent. petrol had been tried.

Rationing Tea, Coffee, and Sugar in the U.S.A.

The restriction in supplies of tea, coffee, and sugar in the U.S.A. has made it necessary for some of the railway companies to ration dining car patrons. In some cases pots of tea or coffee may no longer be supplied, but one cup only to each person; on other lines pots for one have been kept to avoid spilling. Sugar bowls are being retained in the pantries and are proffered individually by waiters. Some companies give one spoonful a person in sealed packets, others use syrup.

The Lackawanna Railroad reports an 80 per cent. increase in the dining car business, and has discontinued pastries requiring large quantities of sugar in their manufacture.

In Canada the railway companies have ceased to use sugar on their trains, but have notices that saccharin may be had on request.

New Canadian Café Car

Last June the Canadian National Railways inaugurated a new type of dining car in the form of a "coffee shop" on train wheels. The idea was inspired by the increase in wartime passenger traffic, particularly on routes where local as well as through travel has grown considerably. It was felt that the ordinary standard dining cars not only tended to a mere leisurely attitude on the part of the traveller, but also severely limited the number of persons able to secure meals. The new car is designed to reduce time required for serving food, and has the kitchen in the centre with a dining department at each end. A passageway at the side of the kitchen connects the two dining cars. Settees with Dunlopillo cushions and backs are placed longitudinally along the walls, and tables for two are fixed in front of the settees, thus leaving the centre of the vehicle clear for the waiters and patrons. Each compartment accommodates 20 persons, or forty to a car, and the number may be increased by extensions between the tables. The food served is the same as in the usual standard dining cars, but obviously the potentialities of such cars for serving snacks, sandwiches, and hot and cold drinks, is enormous.

Wartime U.S.A. Passenger Traffic

Passenger traffic in the U.S.A. has increased on average 50 per cent. over the comparable period last year, but local intensity varies considerably in different parts of the country. Much of the increase is accounted for by the movement of Government employees and Servicemen on leave. Running on the Southern System is up by 100 per cent. An even higher increase in rail traffic is expected now that travel by private cars and road coaches is drastically curtailed. Cuts in road services have already been made and petrol restrictions are causing many private persons to give up using their cars. Troop movements are heavy and likely to be much heavier, so that the prospect of rail travel for the ordinary man is not encouraging, and it would seem that some system of seat reservation might be necessary. Approximately 4,500,000 troops (excluding those proceeding on leave) were moved by the railways in the first five months of this year. This number is roughly as many as was carried during the first thirteen months the U.S.A. was in the last war.

Luggage Problems in the U.S.A.

The crowded conditions of coaches and Pullman cars in the U.S.A., especially during peak periods, has made it necessary for an appeal to be issued to the public by the O.D.T. Passengers are asked to confine themselves to the use of one bag and so help provide more space for other persons.

Ancient U.S.A. Railway for Salvage

The rails along one of the oldest railways in the United States have been lifted for salvage, according to an official statement dated August 11. A total of 138 tons of rail was obtained in the operation, and the contractor who bought the rails intends to re-draw them into steel piping for cot manufacture. The rails formed part of the Crum Creek branch of the Baltimore & Ohio Railroad. This branch crosses the B. & O. main line at Eddystone, Pa., just south of Philadelphia. It was the western end of the branch, running from Eddystone westward for 1·9 miles to an old stone quarry that was torn up. This section of track used for some distance the original right-of-way of the old Leiper Railroad which was built in 1809.

The few railways built in the United States prior to this date included a tramway constructed in 1795 by Silas Whitney to haul bricks from a kiln at the top of Beacon Hill in Boston down the steep slope to the street below. Another was built by Whitney twelve years later to facilitate movement of horse-drawn wagons in a Boston street. Both of the Whitney railways, like the original Leiper line, were constructed with wooden rails. Thomas Leiper built his railway to transport stone from his quarry to a creek three-quarters of a mile away, where the stone could be loaded in barges and floated down to the Delaware River. The railway cost him $1,500 to build.

In 1887, the Leiper Railroad, which had been rebuilt with steel rails, was sold to the B. & O. In recent years, road lorries have been used to haul the quarry products, and this part of the Crum Creek branch has not been used for the last fifteen years. The charter provides that railway service must be supplied to the quarry whenever the quarry owners demand it, but the Leiper family, which still controls the stone works, has agreed to waive this provision for the duration of the war so that the rails may be salvaged for more vital purposes.

British Air Transport

Ever since the outbreak of war, our entire resources of civil aviation have been harnessed to the war effort. This has called for adaptability, improvisation, and departure in many cases from peacetime standards. These features have been particularly prominent in the case of the overseas services. Changes in the military situation have often compelled civil aircraft to be switched over at short notice from one route to another, and the taking of risks which would not have been considered justifiable in peacetime when safety was the keynote of operation. Aircraft have had to follow undeveloped routes, and navigational aids have been on a meagre scale. Maintenance has been increasingly difficult by reason of the shortage of spares and skilled labour, and the variety of types of aircraft in use. New transport aircraft to replace obsolescent pre-war fleets have been scarce, and converted military aircraft have had to be used as well.

Pre-arranged plans for operating our Empire air services by alternative routes across France and Africa went by the board owing to the sudden collapse of France in 1940, and new routes have had to be prepared and operated. The entrance of Italy into the war closed the Mediterranean to our short range civil flying boats and necessitated a long detour to the Middle East, *via* Portugal and West Africa, and thence across Africa to link up with the flying boat route from South Africa to Egypt and India. This in turn was affected by the outbreak of disturbances in Iraq, followed by the hostilities in Syria, and it became necessary to improvise a shuttle service across Iraq with "tanked up" aircraft. Later, in the Far East, the Empire air route had to be adjusted progressively as the Japanese advanced. Yet air communication with Australia ceased only when Burma, Malaya, and the Dutch East Indies had all been occupied by the enemy.

In the Middle East, air transport has had to keep pace with the military situation. The services across Africa have been intensified, with the assistance of the American company, Pan-American Airways, and the Belgian company, Sabena. A new service from Cairo was begun, and later varied as requested. Between the U.K. and the Middle East aircraft have been routed, now *via* the Mediterranean, now *via* West Africa, whichever afforded the best means of maintaining this aerial lifeline. Across the North Atlantic large numbers of pilots who have ferried military aircraft from the other side have been transported back in long-range converted bombers. Malta has been kept in constant touch by air with the outside world, and, with the help of the Dutch, a service to Portugal has been operated with clockwork regularity.

A recent Air Ministry official statement said that full credit must be given to the British Overseas Airways Corporation for all its arduous overseas activities. Since 1940 the Corporation has been the instrument of the Government for this work, and has operated in accordance with directions given by the Secretary of State for Air under the emergency powers conferred upon him by the British Overseas Airways Act, 1939. The loads carried on the service have been almost entirely official, to the exclusion of commercial traffic. Some of the services which the Corporation is operating at the present time are as follow:—

U.K. to Lisbon.—Flying boats, landplanes (chartered from K.L.M.); begun after entry of Italy into the war, June 4, 1940.

U.K. to West Africa.—Boeing 314A and Empire flying-boats; frequent but irregular; begun when Italy entered the war, 1940.

Durban to Karachi.—Flying boats, twice weekly return; the "horseshoe" section of the pre-war Empire routes.

Cairo to Karachi. Landplanes, once weekly return; begun 1942.

Cairo to Teheran. Landplanes, once weekly return; begun November 4, 1941, with Lockheed Lodestar aircraft made available under Lease-Lend Act.

Cairo to Lagos. Landplanes, twice weekly return; begun 1940.

West Africa to Khartoum. Flying boats (*via* Belgian Congo); begun 1940.

U.K. and U.S.A. Boeing 314A flying boats; irregular; begun summer, 1941.

U.K. and Canada. Landplanes; irregular; begun by the British Overseas Airways Corporation, 1941.

There are several other routes operated by the Corporation, in Europe, the Near East, and Africa. For the time being, however, these routes must remain secret. In all, the Corporation is operating over 40,000 miles of routes.

Canadian Presentation to London Railwaymen

The High Commissioner for Canada, the Rt. Hon. Vincent Massey, on September 15, handed over a mobile trailer kitchen unit presented by the Ladies' Auxiliary of the Brotherhood of Locomotive Engineers of Canada to the London Railwaymen's Canteen Association. The association has 40 canteens at large termini and goods depots, catering for 25,000 railwaymen. Approximately 250,000 hot drinks and 175,000 meals are served each week.

The ceremony took place at the L.M.S.R. Kentish Town Motive Power Depot. Before making the presentation Mr. Massey inspected a contingent of the 16th Battalion (L.M.S.R.) City of London Kentish Town "D" Company, Home Guard. Among those taking part in the ceremony were Mr. W. J. Coaley (Secretary of the London Railway Canteens Association), Mr. T. W. Royle (Chief Operating Manager, L.M.S.R., representing the Railway Executive Committee), Sir George Mitcheson (M.P. for St. Pancras), and Councillor Evan Evans (Deputy Mayor of the Metropolitan Borough of St. Pancras).

Tribute to Railway Workers

Presenting the unit to Mr. H. J. Bentley, Chairman of the London Railway Canteens Association, Mr. Massey said that the gift of this mobile canteen came from the Brotherhood of Locomotive Engineers of Canada. The occasion gave him a happy opportunity to extend to a representative group of English railwaymen very cordial greetings from the railwaymen of Canada. The men who belonged to the railway calling in Canada, indeed all Canadians, had watched with the most sincere admiration the skill and fortitude of the men and women railway workers of Britain during these difficult years of war. The railway workers of Britain had written a very proud page in a story of great achievement. They had carried on work under the fire of the enemy to keep the supplies of goods and munitions moving to the places where they were needed most, both at the front and at home. Theirs was a record which would be gratefully and proudly remembered.

After the ceremony the High Commissioner spoke to a number of railway workers, including some women engine cleaners, and saw the L.M.S.R. 5 × P locomotive *Ontario*, which was in the Motive Power Depot.

L.N.E.R. Clerical Training Experiment

The L.N.E.R., with its usual pioneering policy in staff education, is carrying out an interesting experiment in the training of wartime entrants to the clerical staff. A school has been established recently at Scarborough on an experimental basis, and, if it is successful, as the results obtained with the first batch of trainees who have just finished the course suggest that it may be, it is possible similar schools will be established at other centres.

About twenty women station-clerks were the first to be selected for the course, which consists of a month's intensive training in general clerical work such as would be required to be carried out at any station on the line. Subsequent courses will cater for either boys or girls according to circumstances. The issuing of tickets to the public and the answering of passengers' and general inquiries, correspondence, filing, goods invoicing, and dealing with parcels and miscellaneous traffic and the subsequent accountancy work which those transactions involve are all thoroughly explained by a qualified instructor, who, as a member of the clerical staff, is familiar with the many difficulties such operations create. Stress is laid throughout the course on the value of courtesy and tact in dealing with all members of the public.

Practical Tuition

The theoretical course is interspersed with practical tuition both at the school and at nearby stations; at the school the trainees take it in turn to be either behind or in front of the counter; the questions put by those representing the public are left entirely to the latter, and the pupil behind the counter is expected to give a satisfactory reply; one can imagine a student who, while behind the counter, has received a "poser" from a colleague in front doing some intensive thinking to give the questioner a good hard nut to crack. Dummy parcels are weighed and charged and tickets are issued.

Towards the end of the four-week period the trainees are given a searching written examination, after which they are drafted to those jobs for which the results of the test suggest they are best fitted. Girls who obtained 75 per cent. of marks both for goods and passenger work represented a very high proportion of the first batch to receive the training. Some of the questions in the examination paper are very difficult, and, as neither notes nor standard books or forms are available during the period of the examination, a high percentage of marks depends upon the student having paid very close attention to the instructor, and it is certain that the course will equip a clerk employed by the L.N.E.R. to deal effectively with the public and with the many problems which face station staffs, particularly during wartime.

Intensive Training

Besides providing intensive training in accountancy, and other subjects, the experiment is regarded as one which has considerable social value for the clerks themselves. The trainees are provided with board and accommodation at a private hotel in the town, where a senior member of the staff is in attendance as welfare organiser.

Classes in various subjects have been held by the L.N.E.R. for many years, even before the war, but this is the first time that full four-week residential tuition has been tried. Since the first girls to attend have been drafted to their stations several letters of thanks and appreciation have been received by the welfare supervisor acknowledging the help of which their period of instruction has proved to have been.

Left: The Rt. Hon. Vincent Massey, High Commissioner for Canada, at the microphone during the presentation. Right: Chatting with an L.M.S.R. woman engine cleaner after the ceremony

Northern Ireland Road Transport Board

The widespread changes which have been wrought by the war in the economic structure have resulted in the serious consideration in many quarters of possible changes in the post-war organisation of essential industries. Many such proposals have been discussed in our columns from time to time so far as they affect transport, and it seems that there is a widespread impression that the period of Government control of transport will be followed by some such fundamental change as that which resulted from the war of 1914-19. Accordingly, it is useful to have in mind some of the principal features of Government-inspired schemes for the reorganisation of transport which have been brought into effect within recent years. An outstanding example is provided by the Northern Ireland Road Transport Board, which was formed on July 16, 1935, under the Road & Railway Transport Act (Northern Ireland), 1935, to take over virtually all passenger and goods road motor undertakings in Northern Ireland, excepting the Belfast Corporation trams and buses, and the road services of the Londonderry & Lough Swilly Railway. On October 1, 1935, the Board began its operating existence by taking over the Northern Ireland road fleets of the Great Northern Railway (Ireland), the L.M.S.R. (Northern Counties Committee), and the Belfast & County Down Railway, and certain large bus companies, such as the Belfast Omnibus Co. Ltd. Eventually the board became possessed of a miscellaneous collection of buses and coaches acquired from 62 former passenger vehicle operators of all kinds, ranging from owners of single vehicles to long-established and well-organised undertakings. Between October, 1935, and January, 1936, the board acquired a total of 697 passenger vehicles comprising 26 makes and no fewer than 76 different types.

The prices paid for the acquisition of businesses have been regarded in some quarters as too high, especially as the economies to be effected were often by means of eliminating competing services. During the early years of the board's activities there remained a number of buses and goods road motors as yet unacquired and competing virtually as "pirates." Nevertheless, the passenger services soon showed operating profits, but the goods services made substantial losses. In this connection it may be observed that the road transport services of ancillary users, and the local carriers in Belfast and Londonderry (who are permitted to continue within the limits of the boundaries of those cities), resulted in the board's goods transport services being very far from a monopoly.

One of the duties imposed upon the board by its Act of incorporation was that of so exercising its powers as to secure, in conjunction with the railway companies, the provision of a system of transport by road, rail, and other means, which was properly co-ordinated, and gave efficient, economical, and convenient transport services to the public. With this purpose in view, the Act provided for the appointment of a joint committee representative of the board and of the railway companies. One of the duties of this joint committee was to prepare a scheme for pooling the traffic receipts of the board and the railway companies. Such a pooling scheme was finally approved by the committee on November 30, 1937, and confirmed by the Appeal Tribunal on December 24, 1937, but this pool has never been brought into effect, and the scheme remains in abeyance.

Within the past few years, the careful reorganisation of the goods services has shown improved results, and these have been aided materially by increased traffics offering. The following table shows the revenue account balance for the past six years:—

Year ended Sept. 30, 1936	Year ended Sept. 30, 1937	Year ended Sept. 30, 1938	Year ended Sept. 30, 1939	Year ended Sept. 30, 1940	Year ended Sept. 30, 1941
Dr. 71,583	Dr. 117,569	Dr. 125,971	Dr. 8,506	Cr. 65,986	Cr. 288,422

From this it will be seen that, by the outbreak of the present war, the operating deficit had almost reached the credit side, and that since that time substantial operating credits have been shown.

The foregoing remarks may be taken as a reason for failure in early years, but the accounts do not indicate permanent failure, and the operations of the past three years have shown that, now the reorganisation has resulted in substantial operating economies, the undertaking should be capable of being self-supporting in its obligations, granted a continuance of sufficient traffics.

RAILWAY AND OTHER MEETINGS

Tilling & British Automobile Traction Limited

An extra-ordinary general meeting of Tilling & British Automobile Traction Limited was held on September 17 at Brettenham House, Lancaster Place, W.C.2, Sir Frederick Heaton presiding.

The Chairman said: The company as now constituted is mainly the result of an amalgamation of certain interests of the British Electric Traction Co. Ltd., and of Thomas Tilling Limited, which two companies at present hold, in equal proportions, over 94 per cent. of the total issued share capital. This merger of interests was effected prior to the Road Traffic Act of 1930 and consequently before the licensing and operation of buses had been fully regulated. The underlying companies in this particular group do not by any means embrace the whole of the bus interests of the two controlling companies and this makes the general position somewhat complex and not very satisfactory, particularly under present conditions.

To the uninformed it might appear that the proposals represent a development which is contrary to the principles of co-ordination, but this in fact is not so. At the present time there exist three organisations—namely, the British Electric Traction Company, Thomas Tilling, and Tilling & British Automobile Traction—but if the proposals now before you are accepted the three will be reduced to two, thus simplifying the management and leading, your directors believe, to greater efficiency.

The proposed allocation of the ordinary shareholdings between the two new companies (B.E.T. Omnibus Services Limited and Tilling Motor Services Limited) has been made as nearly equal as is practicable without splitting the individual holdings in the underlying companies which would, of course, be undesirable. Similarly, the remaining net assets of the company are also to be divided between the new companies as nearly as may be in equal proportions. Shareholders will receive in respect of each £1 share now held by them two shares of 10s. each—that is, one in each of the new companies; thus there will be no change in the nominal amount of the holdings of the existing shareholders.

In regard to the cumulative participating preference shares, it will be observed that in lieu of the present provision of an 8 per cent. dividend with participation in certain events up to 10 per cent., the new companies will each issue cumulative preference shares carrying a fixed dividend at the rate of 10 per cent. per annum to accrue from July 1, 1942.

One gentleman signing as a preference shareholder has raised a point of criticism in a letter to the press. In effect he states that any depreciation in the value of the assets which are to be taken by one of the two new companies cannot be set off against the value of the assets to be taken by the other; he further implies that fluctuations in the profits of individual operating companies are at present less likely to affect the total profit available for dividend than would be the case with two new companies provided for in the scheme. This is quite fair comment, and if you will bear with me for a few minutes longer I will deal with it here.

The first point I would make is that the two controlling companies—namely, the British Electric Traction Company and Tilings—each of which will hold more than 94 per cent. of the whole of the share capital in one or other of the new companies, are each content to take the whole of their interest in one only of the companies, and this with a full knowledge of the position of the whole group which they possess through their nominees on the board of your company and on the boards of the underlying companies.

Secondly, in the allocation to the two new companies respectively approximate equality has been provided for in respect of the gross receipts of the underlying companies, their net profits, the tangible assets and the number of vehicles, and, moreover, each of the two companies will have interests in various parts of the country, north, south, east, and west.

Finally, I should remind the preference shareholders that the number of preference shares now to be issued by each of the new companies is 200,000 in a total of 4,200,000 shares, and that on the basis of the profits the dividend of 10 per cent. has for some years past been covered more than twenty times over.

Before the company goes into voluntary liquidation at the meeting which is to be held on September 28, it is proposed to pay the full fixed and participating dividends (that is, a dividend at the rate of 10 per cent. per annum, less income tax) on the preference shares for the half-year up to June 30, 1942, and a dividend of 3½ per cent., free of income tax, on the ordinary shares. The fixed dividend at the rate of 8 per cent. per annum on the preference shares has already been paid.

The formal resolutions were passed unanimously.

Notes and News

A. Reyrolle & Co. Ltd.—An interim dividend is announced of 5 per cent. (same).

Southdown Motor Services Limited.—Interim dividend of 5 per cent. (same).

Maidstone & District Motor Services Limited.—Interim dividend of 5 per cent. (same).

Hoffmann Manufacturing Co. Ltd.—Interim dividend on ordinary is 7½ per cent., tax free (same).

Thomas Robinson & Son Ltd.—The directors have declared an interim dividend of 2½ per cent., less tax, the same as a year ago.

Temiscouata Railway.—Gross earnings for the month of July, 1942, were $34,166, compared with $28,579 in July, 1941. Operating expenses advanced from $23,388 to $30,874.

Canadian Pacific Earnings.—Canadian Pacific Railway Company's monthly figures of net railway earnings are arrived at after providing for Canadian E.P.T. and income tax. This has been officially stated by the Deputy Secretary of the company in response to inquiries. The net earnings do not include "other income" from dividends, interest, steamships, hotels, etc.

New Chile—Argentina Railway.—According to a message from Santiago, the deputies for the province of Antofagasta have submitted to Congress a proposal for the allocation of 30,000,000 pesos towards the completion of the Chilean section of the above line. Details concerning the construction of this line were published in our May 15 issue, and also on page 248 of our September 11 issue.

Absorption of Private Lines in Sweden.—Reuters reports that the amalgamation of private railways with the State Railways system by voluntary agreement continues in conformity with the Riksdag's decision some years ago. A preliminary agreement has been signed for the purchase by the State of the lines Malmö-Trelleborg (19 miles), Vellinge-Skanoer-Falsterbo (11 miles), and Trelleborg-Rydsgaard (22 miles). The amalgamation with the State Railways, if finally agreed to, will take place from July 1, 1943.

British Aluminium Co. Ltd.—Interim dividend 3 per cent. (same).

Great Western of Brazil Railway Co. Ltd.—The company is inviting tenders of the 4 per cent. debentures for purchase for the sinking fund on October 21. Tenders at a price to be stated in the tender must be lodged by 2 p.m. on September 30 with Glyn, Mills & Co. (Coupon Office), 67, Lombard Street, E.C.3. The result of the tenders will be communicated to bondholders tendering as soon as possible thereafter. The company reserves the right to reject any tender in part or in whole.

Argentine Grain Surplus.—The Argentine Ministry of Agriculture has issued its revised figures of the amount of grain and seed available in the country for export. These show that the exportable surplus of wheat now amounts to 5,100,000 tons compared with 2,746,000 tons at the corresponding date last year; maize, 9,267,000 tons (against 8,572,000 tons); linseed, 1,778,000 tons (927,000 tons). The amount of wheat unsold remains one of the largest on record, and contrasts with the 474,000 tons held two years ago.

Coal for Steam Raising.—A joint meeting of the Institution of Electrical Engineers and the Institution of Mechanical Engineers will be held in the Lecture Theatre of the I.E.E. at 5.30 p.m. on November 5 (tea 5 p.m.). Mr. J. N. Waite, of the Central Electricity Board, will deliver a paper entitled "Coal for Steam Raising." Advance copies of this paper will be available on application to the Secretary, Institute of Fuel, 30, Bramham Gardens, London, S.W.5, about ten days before the meeting.

La Guaira & Caracas Railway Co. Ltd.—Railway receipts in the year 1941 amounted to £59,765 (£59,333), and working expenses were £42,088 (£41,634), leaving net receipts of £17,677 (£17,699). Profit on exchange produced £23,901 (£17,706). Net balance on the year's working is £18,000 (£9,515), and this, deducted from the debit balance brought forward, leaves a debit balance of £59,047 to be carried forward. The directors anticipate being able to pay further 2½ per cent. interest arrears on the 5 per cent. debenture stock to September 1, 1938, on December 1 next.

Vickers Limited.—The directors propose to pay on October 22 an interim dividend of 4 per cent. actual, less tax, on account of the year 1942 (same).

Potteries Motor Traction Co. Ltd.—This company, a subsidiary of the British Electric Traction Co. Ltd., has declared an interim dividend of 4 per cent., less tax (same).

Hurst, Nelson & Co. Ltd.—The directors recommend that the dividend on the ordinary shares for the year to mid-July last be maintained at 12½ per cent. (2s. 6d. a share) less tax. Net profits for the year, subject to audit, were £31,462 (£32,132), after providing £2,798 for war damage insurance and £2,500 for deferred repairs.

South Indian Railway Co. Ltd.—The directors have decided to recommend a final dividend on the ordinary stock of 2¾ per cent.—1 per cent. from surplus profits and 1¾ per cent. guaranteed interest—less income tax, making with the payment of 1¾ per cent. guaranteed interest made on July 1, 1942, a total of 4½ per cent. on account of the year 1942, payable on January 1, 1943.

British Railway Quotations.—The rearrangement of the make-up of the British railway securities in the Stock Exchange Daily List, as recorded in our last week's issue, was carried out on Monday, September 21. The table which we publish weekly also has been slightly modified and is now similar to the official list.

American Locomotive Power.—A recent power survey in the United States shows that the 42,000-odd railway steam locomotives in that country have an aggregate capacity of about 88,000,000 h.p., or an average of over 2,000 h.p. per locomotive, compared with an aggregate of 56,700,000 h.p. of all the stationary steam plants.

Aluminium Pistons.—In an endeavour to lighten the reciprocating weights of large high-speed passenger locomotives, the Chicago, Burlington & Quincy Railroad has been using pistons of aluminium alloy in some of its 4-8-4 steam locomotives. Two nickel-bronze rings are fitted, and each ring is formed of two half rings in eight pieces maintained against the cylinder wall by a circular spring. It has been claimed that these rings can run 95,000 to 100,000 miles before replacement is necessary.

Charles Roberts & Co. Ltd.—Mr. Duncan Bailey, O.B.E., presiding at the fifteenth ordinary general meeting of this company, said it could be demonstrated that, in the last analysis private enterprise, with all its shortcomings, was the most efficient, and the cheapest form of stewardship yet evolved by civilised man for the running of industry. There would seem to be an idea growing up which, unfortunately, to some extent had been fostered in Parliament, that the payment of a dividend to any person known as a shareholder was something of which one ought to be ashamed, whereas that dividend constituted the fair wages of capital. Why shareholders should be singled out for attack in this unfair and arbitrary manner, while other sections of the community had notoriously received greatly increased incomes, it was difficult to understand. Continuing, Mr. Bailey said: "You, the

Turkish editors on a visit to this country recently visited Waterloo Signal Box and Feltham Marshalling Yard. They were met by Colonel Eric Gore-Brown (Deputy-Chairman), Mr. E. J. Missenden (General Manager), and Mr. J. Elliot (Deputy-General Manager). The editors, with Southern Railway officers, are shown above

owners of this property, are receiving no extra remuneration for its use, in spite of its enormously increased activities, and what is more, you have willingly and without compulsion, placed all your assets at the disposal of the State."

Civil Engineers and the Building Industry.—At a meeting held at the Institution of Civil Engineers on September 15, it was suggested that there should be closer relationship between the civil engineer, the architect, the surveyor, the builder, the operative, and the building-owner. Mr. George Hicks, M.P., Parliamentary Secretary to the Ministry of Works & Planning, was the principal speaker. In the ensuing discussion, one speaker urged that the mechanical engineer—in the provision of labour-saving appliances on the site—should not be overlooked. The ensuing discussion did not make clear how the new relationship was to be brought about.

Trans-Canada Air Lines.—There was a further increase for the month of June last in passenger, airmail, and express traffic on the Trans-Canada Air Lines. The number of passengers conveyed was 10,317, an increase of 768 over the preceding month and of 1,688 over June, 1941; and 174,104 lb. of mail was carried, representing an increase of 7,694 lb. over last May and of 55,201 lb. over June of last year; nearly 6,000 lb. a day was handled. Express traffic also attained its highest figure yet with a total of 27,406 lb. conveyed last June, compared with 22,184 lb. the month before, and representing an increase over the figure for June, 1941, of 16,803 lb. The majority of passengers who were carried were travelling on war business.

Institution of Electrical Engineers.—Ordinary and informal meetings of the Institution and meetings of the installation, measurements, transmission, and wireless sections, will be held during the forthcoming session. All meetings will commence at 5.30 p.m. The ordinary meetings will be: October 1, Prof. C. L. Fortescue, O.B.E., M.A., inaugural address as President; November 5, Mr. J. N. Waite, "Coal for Steam Raising" (joint meeting with the Institution of Mechanical Engineers); December 3, Lt.-Colonel K. Edgcumbe, T.D., "Standardisation as Applied to Industrial Electrical Instruments"; February 4, Mr. C. T. Melling, "General Factors Affecting the Uniformity of Tariffs"; Mr. P. Schiller, "Towards the 'Correct' Domestic Multi-Part Tariff"; March 4 and April 1, particulars to be announced later; April 29, Prof. D. R. Hartree, M.A., Ph.D., F.R.S., will deliver the thirty-fourth Kelvin Lecture.

Agreed Charges.—Applications numbering 166 for the approval of agreed charges under the provisions of Section 37 of the Road & Rail Traffic Act, 1933, have recently been lodged with the Railway Rates Tribunal. Notices of objection must be filed on or before October 13.

Dorada Railway Co. Ltd.—For the year 1941 gross revenue was £148,918, against £146,698 for 1940, and expenses £121,029, against £118,389, leaving net receipts of £27,889 (£28,309). Balance on the year's working, after adding sundry credits and providing for prior charges and exchange, is £7,909 (£13,661). Adding £6,984 brought forward makes a total of £14,893, out of which a dividend of 2 per cent. (3 per cent.) will be payable, leaving £2,806 to be carried forward. To overcome the exchange difficulty, which has resulted in the last three years in the accumulation of pesos, the company has loaned 1,000,000 pesos against Colombian Treasury Bills, payable in London and maturing over a period of 3 years and 3 months, for equivalent sterling at the exchange ruling at the date of the arrangement, with interest at 4 per cent. per annum on outstanding balances, less local taxes.

Taxis at Waterloo.—Because of the taxi shortage there are times when people have to wait for some time before obtaining a taxi at a railway station. In order to make the best possible use of the taxis and prevent last-comers "jumping" taxis in front of those who have been waiting, the Southern Railway has organised a special arrangement whereby passengers and porters with luggage form into a queue. The arrangements are supervised by the police and nothing but praise has been received from the public on what has been done. It was brought into operation on September 20; the queue system has been responsible over a period of 12 hr. of catering for 3,500 passengers in 1,600 taxis, and 200 people are now catered for in 7 min., whereas in the past passengers had to wait in the roadway for considerable periods. A poster has been put up notifying passengers where to queue and now all take their turn behind a barrier.

Queues for taxis have been introduced at Waterloo Station, where passengers and porters line up for available vehicles and order has replaced the scramble which at one time caused complaints

Trent Motor Traction Co. Ltd.—This company announces an interim dividend on the ordinary shares of 4 per cent. on account of the year 1942, payable on October 16. A similar dividend was declared a year ago.

British and Irish Railway Stocks and Shares

Stocks	Highest 1941	Lowest 1941	Prices Sept. 18, 1942	Rise/Fall
G.W.R.				
Cons. Ord.	43¾	30¾	47½	—
5% Con. Pref. ...	109½	83½	107	—
5% Red. Pref. (1950)	105½	96½	105	—
5% Rt. Charge ...	129½	116	125½	—
5% Cons. Guar. ...	128	110½	123	—
4% Deb.	113½	102½	109	—
4½% Deb.	115	105½	110½	—
4½% Deb.	121½	112	115½	—
5% Deb.	132	122	127½	—
2½% Deb.	70	62½	75½	+ 1
L.M.S.R.				
Ord.	17½	11	23	+ 1
4% Pref. (1923) ...	53	33½	57½	+ 2
4% Pref.	68½	43½	73½	+ 2
5% Red. Pref. (1955)	97⅛	77	99⅛	—
4% Guar.	100	85½	99	—
4% Deb.	105½	97	104	—
5% Red. Deb. (1952)	110½	106½	109½	—
L.N.E.R.				
5% Pref. Ord. ...	3½	2½	4½	— ½
Def. Ord.	2	1½	2½	—
4% First Pref. ...	52½	33	56½	+ 2
4% Second Pref. ...	19½	10	25	+ ½
5% Red. Pref. (1955)	79½	52	89½	+ 2
4% First Guar. ...	90½	74½	92	+ ½
4% Second Guar. ...	80½	59	83½	+ 1
3% Deb.	79¼	68¾	79	—
4% Deb.	104	91½	103	—
5% Red. Deb. (1947)	106	102½	104½	—
4½% Sinking Fund Red. Deb.	103½	99-½	103½	—
SOUTHERN				
Pref. Ord.	65½	43½	68½	+ ½
Def. Ord.	15⅝	9	18½	+ ½
5% Pref.	107	77½	105½	—
5% Red. Pref. (1964)	107	89½	107½	—
5% Guar. Pref. ...	128	111	123	—
5% Red. Guar. Pref. (1957)	114½	107½	110½	—
4% Deb.	112	102½	108	—
5% Deb.	130½	119	126½	—
4% Red. Deb. (1962–67)	108½	102	108½	—
4% Red. Deb. (1970–80)	108½	102½	107½	—
FORTH BRIDGE				
4% Guar.	99	85½	103½	—
4% Deb.	99½	90½	105	—
L.P.T.B.				
4½% "A"	120½	109½	115½	—
5% "A"	130½	115½	123½	—
4½% "T.F.A." ...	103½	99½	100	—
5% "B"	117	102	114½	—
"C"	46½	28½	48	—
MERSEY				
Ord.	24½	19½	23	—
3% Perp. Pref. ...	58	51½	59	—
4% Perp. Deb. ...	100	90	99	—
3% Perp. Deb. ...	73½	63	77	—
IRELAND				
BELFAST & C.D.				
Ord.	4	4	9	—
G. NORTHERN				
Ord.	14½	3	23	— ½
G. SOUTHERN				
Ord.	14½	5	15	—
Pref.	17	10	20½	—
Guar.	44	16	42½	— ½
Deb.	61	42	64	—

Railway Stock Market

With market sentiment influenced by the disposition to await war developments on the Russian front, the volume of Stock Exchange business has shown further contraction at the time of writing. Nevertheless, in the absence of selling, the general undertone has remained firm. Among British Funds there was an easier tendency in long-dated stocks, but short-dated stocks showed an improving trend. Firmness was maintained in home railway debentures, but main attention continued to be given to junior stocks. Despite the recent improvement in the latter, yields continue to have a very attractive appearance, bearing in mind that it is doubtful if there is any other range of securities whose dividend prospects during the war period are as clearly defined. As compared with a week ago, the largest gains on balance have been shown by L.N.E.R. first preference, L.M.S.R. senior, and 1923 preferences, and Southern preferred, which have sound investment merits based on the cover for dividend requirements. Moreover, these stocks have an active market and show much more attractive yields than can be obtained on the leading preference shares of industrial companies. Home railway ordinary stocks were again active, but were less prominent than a week ago. Nevertheless, on balance further gains were shown. In some quarters of the market there is continued talk of the possibility that fractionally higher dividends may be in prospect if there is improvement in revenue from sources which do not come within the terms of the wartime financial agreement. It is realised, however, that it is difficult to forecast the trend in revenue from these outside sources. Nevertheless, it is being assumed in the market that the latter will not be affected to any extent by the curtailment of passenger road services; it is pointed out that it is not the general intention to abolish long-distance road services except where they run parallel with a railway, but to effect curtailment and rearrangement of local bus routes. London Transport "C" stock has moved lower, although the withdrawal of the Green Line services will not affect the amount drawn by the board from the total rental payable under the financial agreement between the Government and the railways.

At 47½, Great Western ordinary was slightly higher on balance, and the guaranteed and 5 per cent. preference stocks were again 123 and 107 respectively, and the 4 per cent. debentures 109. L.M.S.R. ordinary continued to attract attention and has improved to 23, which compares with 22⅛ a week ago. Moreover, this railway's senior preference has on balance risen further from 72 to 73½, and the 1923 preference from 56 to 57½, and the guaranteed stock was maintained at 99. L.N.E.R. preference stocks lost part of an earlier improvement, but nevertheless, the firsts were 56, compared with 55 a week ago, and the seconds 24¾, compared with 24½. L.N.E.R. first guaranteed showed improvement from 91½ to 92, and the second guaranteed was a point better at 83½. Southern deferred was fractionally higher at 18¼, and the preferred ordinary has risen further from 67⅞ to 69, the 5 per cent. preference was slightly higher at 105½, and the guaranteed stock again 123. Compared with a week ago, London Transport "C" has moved back from 48⅛ to 47¾.

There was again not a great deal of business passing in foreign railway securities. Great Western of Brazil 4 per cent. debentures moved up on the invitation for tenders in connection with the sinking fund. B.A. Western 4 per cent. debentures were better at 48, as was B.A. Gt. Southern 5 per cent. preference at 25½. San Paulo ordinary was steady, awaiting the interim dividend. Elsewhere, Canadian Pacifics showed response to the trend in traffic receipts.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open 1941-42	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1941	No. of Weeks	Aggregate Traffics to date: Totals: This Year	Aggregate Traffics to date: Totals: Last Year	Aggregate Traffics to date: Increase or Decrease	Shares or Stock	Prices: Highest 1941	Prices: Lowest 1941	Prices: Sept. 18, 1942	Yield% (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	13.9.42	17,110	— 3,560	37	771,130	688,300	+ 82,830	Ord. Strk.	10⅜	3½	11	Nil
	Argentine North Eastern ...	753	12.9.42	15,738	+ 2,820	11	145,050	132,306	+ 12,744	,,	4	1	5	Nil
	Bolivar	174	Aug., 1942	3,790	— 60	34	35,191	30,717	+ 4,474	6 p.c. Deb	5	5	12½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	8	2⅛	16	Nil
	Buenos Ayres & Pacific ...	2,807	12.9.42	89,400	+ 16,800	11	898,680	860,760	+ 37,920	Ord. Stk.	7⅛	1⅛	5	Nil
	Buenos Ayres Great Southern	5,080	12.9.42	136,200	+ 10,560	11	1,337,400	1,330,680	+ 6,720	Ord. Stk.	10⅛	3⅛	8⅛	Nil
	Buenos Ayres Western ...	1,930	12.9.42	50,640	— 660	11	520,440	500,040	+ 20,400	,,	9	2⅛	7⅛	Nil
	Central Argentine	3,700	12.9.42	131,904	+ 10,302	11	1,310,796	1,166,526	+ 144,270	,,	8⅛	2⅛	6⅛	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	9⅛	⅛	3⅛	Nil
	Cent. Uruguay of M. Video...	972	5 9.42	19,783	— 824	10	193,800	209,666	— 15,866	Ord. Stk.	9⅛	1	5	Nil
	Costa Rica	262	July, 1942	12,761	— 11,815	52	12,761	24,576	— 11,815	Stk.	15⅛	11⅛	13⅛	Nil
	Dorada	70	June, 1942	17,669	+ 4,469	25	81,215	75,300	+ 5,915	1 Mt. Db.	97	97	88⅛	6⅛
	Entre Rios	808	12.9.42	21,234	+ 2,886	11	186,624	197,934	— 11,310	Ord. Stk.	6⅛	⅛	5⅛	Nil
	Great Western of Brazil ...	1,030	12.9.42	10,300	+ 2,000	37	364,700	327,400	+ 37,300	Ord. Sh.	11/-	1/-	2⅜	Nil
	International of Cl. Amer. ...	794	June, 1942	$115,937	— $5,230	25	$844,587	$673,300	— $171,387	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	⅜	6d.	1⅛	Nil
	La Guaira & Caracas... ...	22½	Aug., 1942	9,825	+ 1,245	33	54,765	51,825	+ 2,940	—	—	—	—	—
	Leopoldina	1,918	12.9.42	31,735	— 1,400	37	1,101,415	940,708	+ 160,767	Ord. Stk.	4	⅛	4⅛	Nil
	Mexican	483	14.9.42	ps. 237,900	— ps. 63,900	12	ps. 3,139,900	ps. 3,361,600	— ps. 221,700	,,	⅜	¼	1⅛	Nil
	Midland of Uruguay	319	July, 1942	11,961	— 2,549	4	11,561	14,510	— 2,549	—	—	—	—	—
	Nitrate	382	15 9.42	7,078	— 2,354	23	132,196	101,153	+ 31,043	Ord Sh.	66⅜	1¼	3⅞	3⅞
	Paraguay Central	274	11.9.42	$3,666,000	+ $864,000	11	$40,124,000	$37,512,000	+ $2,612,000	Pr. Li. Stk.	43/-	29	47½	12⅛
	Peruvian Corporation ...	1,059	Aug., 1942	85,805	+ 14,147	9	165,606	137,208	+ 28,398	Pref.	6½	1⅛	14⅛	Nil
	Salvador	100	June, 1942	c 46,000	— c 10,000	52	c 1,005,172	c 799,683	+ c 205,489	—	—	—	—	—
	San Paulo	153½	6.9.42	37,625	+ 2,700	36	1,304,685	1,339,754	— 35,069	Ord. Stk.	52	24½	53½	3⅜
	Taltal	160	Aug.,1942	5,235	— 750	8	11,725	9,165	+ 2,560	Ord. Sh.	1	6/-	1⅛	Nil
	United of Havana	1,346	12.9.42	35,369	+ 16,510	11	416,551	211,435	+ 205,116	Ord. Stk.	2⅛	⅛	4⅛	Nil
	Uruguay Northern... ...	73	July, 1942	1,137	— 220	4	1,137	1,357	— 220	—	—	—	—	—
Canada	Canadian National	23,562	14 9.42	1,572,000	+ 279,200	37	50,426,800	41,098,000	+ 9,328,800	—	—	—	—	—
	Canadian Pacific	17,049	14.9 42	1,070,000	+ 190,400	37	34,963,600	29,570,600	+ 5,393,000	Ord. Stk.	13⅞	7⅛	11⅛	Nil
India†	Barsi Light	202	July, 1942	23,685	+ 8,903	17	63,285	67,635	— 4,350	—	—	—	—	—
	Bengal & North Western ...	2,090	July, 1942	261,600	— 5,267	18	1,080,300	1,092,128	— 11,828	Ord. Stk.	345	253	349½	5⅞
	Bengal-Nagpur	3,267	20.6.42	284,100	+ 31,301	11	2,271,525	2,107,876	+ 163,649	,,	101	95⅜	96	4⅞
	Madras & Southern Mahratta	2,939	30.6.42	212,550	+ 3,338	13	1,945,373	1,858,969	+ 86,404	,,	105⅞	101¼	100	7⅛
	Rohilkund & Kumaon ...	571	July, 1942	58,275	— 3,099	18	234,300	272,651	— 38,351	,,	342	290	351¼	4⅞
	South Indian	2,402	20 6 42	179,171	+ 43,616	12	1,376,295	1,113,057	+ 263,238	,,	100	87	97	4⅛
Various	Beira	204	June, 1942	71,394	—	38	672,109	—	—	—	—	—	—	—
	Egyptian Delta	607	10.8.42	11,442	+ 3,483	20	139,046	89,984	+ 49,062	Prf. Sh.	1¼	29/-	3	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	68	45	37½	9⅞
	Midland of W. Australia ...	277	July., 1942	27,869	+ 9,221	52	27,869	18,648	+ 9,221	Inc. Deb.	90½	86½	89½	6
	Nigerian	1,900	27.6.42	61,623	+ 16,678	13	693,193	697,968	— 4,775	—	—	—	—	—
	Rhodesia	2,442	June, 1942	488,130	—	13	4,306,101	—	—	—	—	—	—	—
	South Africa	13,291	4 7.42	793,090	+ 20,324	15	10,428,739	9,945,447	+ 483,262	—	—	—	—	—
	Victoria	4,774	Mar., 1942	1,339,304	+ 366,183	37	10,425,476	8,391,343	+ 2,034,133	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛ Argentine traffics are given in sterling calculated @ 16⅝ pesos to the £. † Receipts are calculated @ 1s. 6d. to the rupee § ex dividend